centrifuge No.: MPW-260, MPW-260R, MPW-260RH

user manual - Cat. No.: 20260/R/RH.ENG

2014-04-02

U S E R M A N U A L

LABORATORY CENTRIFUGE

MPW-260/R/RH

Read this before use!

MPW MED. INSTRUMENTS, 46 Boremlowska Street, 04-347 Warsaw/Poland
tel. +48 22 610 81 07 (service), fax +48 22 610 55 36
mpw@mpw.pl, www.mpw.pl

CE IVD

WARNING SIGNS AND HAZARD ICONS.

	WARNING! Warning of potential injury or health risk.
	DANGER! Risk of electric shock with potential for severe injury or death as a consequence.
	DANGER! Biohazard with potential for risk to health or death as a consequence.
	DANGER! Risk of explosion with potential for severe injury or death as a consequence.

This manual was prepared with special care. MPW MED. INSTRUMENTS may change the manual at any time and without notice because of improvements, typographical errors, inaccuracies of current information or improvements to facilities.

Content

1 TECHNICAL SPECIFICATION 5

2 APPLICATION 6

3 INSTALLATION 7

3.1 LOCATION 7
3.2 CURRENT PROTECTION 7

4 SAFETY NOTES 8

4.1 OPERATING PERSONNEL 8
4.2 GUARANTEE 8
4.3 LOADING THE ROTOR 9
4.4 SAFETY HINTS 10
4.5 MAINTENANCE CONDITIONS 11
4.6 SAFETY PRECAUTIONS 11

5 OPERATING 13

5.1 CENTRIFUGE DESCRIPTION 13
5.2 DESIGN 14
5.3 ROTOR AND ACCESSORIES INSTALLATION 14
5.4 CONTROL DEVICE 15
5.5 SETTING PARAMETERS 15
5.6 SAFETY FEATURES 15

6 CENTRIFUGATION 17

6.1 CONTROL PANEL 17
6.2 DISPLAY 18
6.3 CENTRIFUGING NOTES 19
6.4 SETTING UP RPM, RCF, TIME, TEMPERATURE 20
6.5 USER PROGRAMS 22
6.6 PROGRAMS WITH USER CHARACTERISTICS 24
6.7 CHOOSING ROTORS 24
6.8 SHORT MODE 25
6.9 TERMINATING CENTRIFUGATION 25

7 TEMPERATURE CONTROL 26

7.1 INITIAL COOLING (R/RH) OR HEATING (RH) WITH CENTRIFUGING 26
7.2 INITIAL COOLING (R/RH) OR HEATING (RH) WITHOUT CENTRIFUGING – THERMAL CHAMBER 27
7.3 COOLING (R/RH OR HEATING (RH) IN "START DELAY – OF TEMPERATURE" MODE 27
7.4 COOLING (R/RH) OR HEATING (RH) IN „SHORT" MODE 27
7.5 COOLING (R/RH) NOTES 28

8 PARAMETERS OF CENTRIFUGATION 29

8.1 ACCELERATING/DECELERATING – CHANGING CHARACTERISTICS 29
8.2 RADIUS 30
8.3 SAMPLE DENSITY 30
8.4 THERMAL CHAMBER 31
8.5 AUTOMATIC LID OPENING 31
8.6 START DELAY - OF TIME 31
8.7 START DELAY – OF TEMPERATURE 32
8.8 ERRORS 33
8.9 TEMPORARILY DISABLED FUNCTIONS 36
8.10 UNBALANCE 36
8.11 PRINTING REPORT - USB 37

9 CONFIGURATION 42

9.1 PASSWORD PROTECTION 43
9.2 LANGUAGE 45
9.3 MAIN SCREEN MODES, SCREEN SAVER 45
9.4 SCREEN SAVER 46
9.5 TEMPERATURE OFFSET 46
9.6 TIME/DATE 46
9.7 TOTAL WORKING TIME 47
9.8 ROTATING TIME 48
9.9 SOUNDS 48
9.10 ERROR CODES 49
9.11 FACTORY SETTINGS 49
9.12 USER CHARACTERISTICS ACCEL/DECEL 50
9.13 ROTOR RUNTIME 54
9.14 CYCLES HISTORY 54
9.15 MANUFACTURER'S DETAILS 54

10 MAINTENANCE 55

10.1 CLEANING OF THE CENTRIFUGE 55
10.2 MAINTENANCE OF CENTRIFUGE ELEMENTS 55
10.3 STERILIZATION 56
10.4 CHEMICAL RESISTANCE 58

11 TROUBLESHOOTING 59

12 GUARANTEE 61

13 DISPOSAL 62

14 MANUFACTURER'S INFO 63

15 ANNEXES 65

- **OPTIONAL ACCESSORIES**
- **STATEMENT OF CONFORMITY**
- **DECLARATION OF DECONTAMINATION - REPAIR**
- **DECLARATION OF DECONTAMINATION - RETURN**
- **CONVERSION TABLE FOR RPM/RCF (NOMOGRAM)**

1 Technical specification

manufacturer	MPW MED. INSTRUMENTS 46 Boremlowska Street, 04-347 Warsaw, Poland					
type	**MPW - 260**		**MPW - 260R**		**MPW - 260RH**	
mains voltage, L1+N+PE, ±10%	230V	115V	230V		115V	
mains frequency, ±10%	50/60Hz		50Hz	60Hz	60Hz	
connected load (max.)	250W		600W		800W	
overcurrent protection	4A	4A	10A		10A	
cooling medium	-		R507 (CFC/HCFC free)			

	MPW - 260	**MPW - 260R**	**MPW - 260RH**
capacity (max.)	500 ml		
speed – RPM	90 ÷ 18000 rpm (step 1 rpm)		
force – RCF	24270 x g (step 1 x g)		
kinetic energy (max.)	8800 Nm		
running time	00:00:01 ÷ 99:59:59 – [hours, min., sec] (step 1s)		
time counting	since start button is pressed / since preselected speed is reached		
short-time operation mode – SHORT	yes		
continuous operation mode – HOLD	yes		
user programms	99 +1*		
adjustable temperature	-	-20 ÷ 40°C** (step 1°C)	-20 ÷ 55°C** (step 1°C)
initial cooling/heating PROG 99 (90 ÷ 2500 RPM)	no/no	yes/no	yes/yes
guaranteed temperature with max. rotor speed	-	≤4°C	
cooling/heating without centrifuging	no	yes/no	yes/yes
cooling/heating with centrifuging	no	yes/no	yes/yes
acceleration (ACEL)	10 linear curves		
deceleration (DECEL)	10 linear curves		
programmable non-linear curves:			
acceleration	10		
deceleration	10		
USB communication	yes		
Electromagnetic compatibility	according to PN-EN 55011		
ambient conditions	PN-EN 61010-1 p.1.4.1		
set-up site	indoors only		
ambient temperature	2° ÷ 40°C		
humidity (maximum relative humidity)	< 80%		
excess-voltage category	II PN-EN 61010-1		
pollution degree	2 PN-EN 61010-1		
safety area	300 mm		
dimensions			
height (H)	320 mm	320 mm	
width (W)	365 mm	365 mm	
depth (D)	495 mm	660 mm	
with open cover (H_{oc})	665 mm	665 mm	
noise level	56 dB	56 dB	
weight 230V	28 kg	47 kg	48,5 kg
weight 115V	29,5 kg	50,7 kg	52,2 kg

* factory program (program no. 99)

**time and possibility of obtaining a set temperaturę is dependant on multiple factors , including: rotor type, established RPM, ambient temperaturę; accuracy: - ±1*C appropriate for place of temperature sensor

Menu languages: POLISH, ENGLISH, GERMAN, SPANISH, ITALIAN, PORTUGUESE, RUSSIAN (without national characters).

2 Application

The MPW-260/R/RH centrifuges are table top laboratory centrifuge for in vitro diagnostic (IVD). Devices are used for separation samples taken from people's, animal's and plant's components of different densities, under the influence of the centrifugal force, to provide information about their biological state (MPW-260 – ventilated, MPW-260R – with cooling, MPW-260RH – with cooling and heating). Its construction ensures easy operation, safe work and wide range of applications at laboratories engaged in routine medical analyses, biochemical research works etc. This centrifuge is not biotight and therefore during centrifugation of preparations requiring biotightness one has to use closed and sealed containers and rotors. In the centrifuge, it is prohibited to centrifuge caustic, inflammable and explosive preparations.

3 Installation

Open the package. Remove the box containing the accessories. Take out centrifuge from the container. Keep the box and packing materials in case of service shipping.

name	qty (pcs.)	cat no.
centrifuge MPW-260/R/RH	1	see name plate
complete clamp	1	17142
spanner for the rotor	1	17099T
emergency opening of the cover		17642
power cord 230V / 115V	1	17866/17867
petroleum jelly 20ml	1	17201
Fuse WTA T 4A 250V / WTA T10A 250V	2	17861/17863
USB A-A cable, CD (MPW Editor application + FTDI USB drivers)	1	16598
user manual	1	20260/R/RH.en

3.1 Location

	▪ The centrifuge shall not be located near source of heat and shall not be subjected to direct sunlight. ▪ The table for the centrifuge shall be stable and shall have flat-levelled table top. ▪ It is necessary to ensure a safety zone of the minimum 30 cm round the centrifuge from every direction. ▪ At the change of the place from cold to warm one, condensation of water will occur inside the centrifuge. ▪ It is important then that sufficient time be provided for drying the centrifuge prior to starting the centrifuge again (min. 4 hours).
	▪ Supply voltage given on the rating plate has to be consistent with local supply voltage. MPW MED. INSTRUMENTS laboratory centrifuges are 1st safety class devices and they are provided with the three-core cable with the plug resistant to dynamic loadings. ▪ Mains socket shall be provided with the safety pin. It is recommended to install emergency cut-out that shall be located far from the centrifuge, near the exit or beyond the room.
	▪ **Before switching on, check whether the centrifuge is connected to power supply correctly.**

3.2 Current protection

	The centrifuge is equipped with thermal current protection. Fuse is situated in the plug-in socket unit at back wall of the centrifuge.

4 Safety notes

4.1 Operating personnel

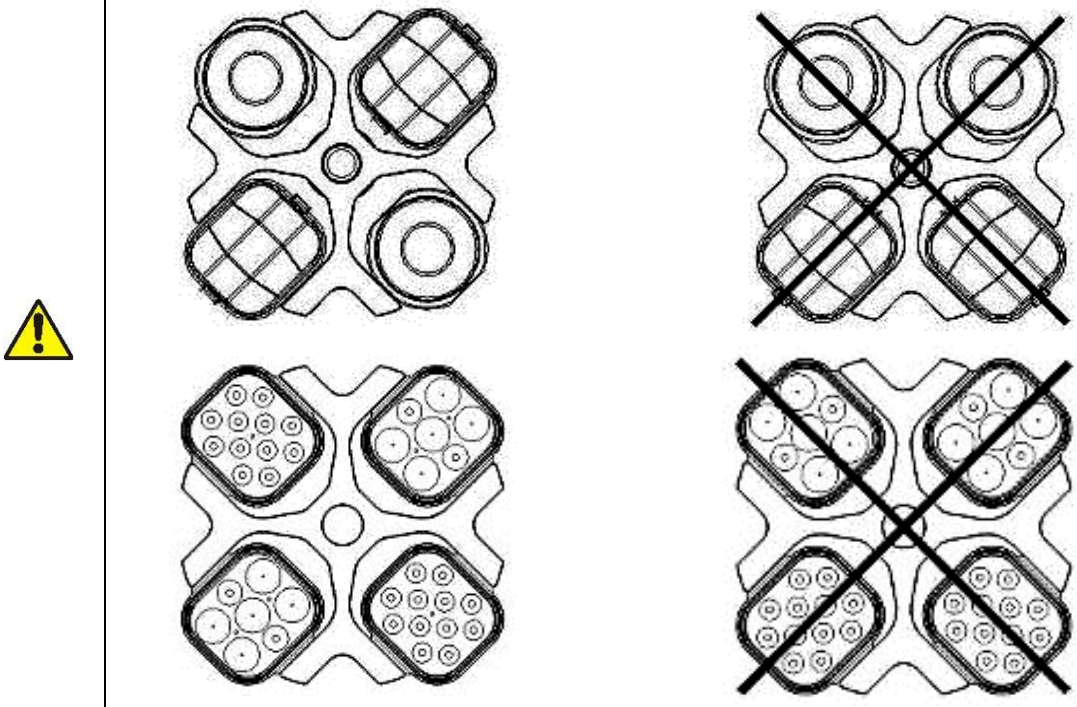
	▪ Laboratory centrifuge can be operated by laboratory personnel after getting acquainted with user manual. ▪ **User manual shall be always held near the centrifuge.** ▪ The centrifuge can not be misused.

4.2 Guarantee

	▪ Guarantee period amounts to minimum **24 months** (unless otherwise specified in the purchase documents). ▪ The service life of the centrifuge specified by the manufacturer amounts to **10 years**. ▪ After termination of guarantee period it is necessary to carry out yearly technical inspections of the centrifuge. ▪ Manufacturer reserves the right to make technical changes in manufactured products. ▪ Maximum period of storage of not used centrifuge amounts to **1 year.** After this period, a service authorized by manufacturer should carry out technical inspection of the centrifuge.

4.3 Loading the rotor

- Fix the rotor on the motor axis firmly.
- Avoid unbalance.
- Load opposite buckets with the same accessories.
- Centrifugation of the test tubes of different sizes:
  - There is a possibility to centrifuge test tubes of different sizes; however, it is absolutely necessary in such cases that opposite buckets and round carriers be the same.
  - Mass of different containers with test tubes spun at the same time has to be comparable. Swing-out rotors must be equpiied with all four buckets.
- Lubricate the swing-out rotor journal pins.



CORRECT **WRONG**

CORRECT **WRONG**

- It is necessary to insert test tubes symmetrically on the opposite sides.

	FILLING TUBES ▪ Fill test tubes outside the centrifuge. ▪ Please pay special attention to the quality and proper thickness of the glass test tubes walls. Those shall be test tubes for centrifuges. ▪ Fill test tubes outside the centrifuge.

4.4 Safety hints

	ROTORS MAINTENANCE ▪ Lubricate the swing-out rotor journal pins. ▪ Use only accessories in good condition. ▪ Protect equipment against corrosion using accurate preventive maintenance.
	HS accessories maintenance ▪ **HS** accessories maintenance. ▪ Make sure that rubber O-rings are lightly coated with silicone grease. Use high vacuum grease, e.g. type „C" by LUBRINA.

	HAZARDOUS MATERIALS ▪ Infectious materials could be processed in closed buckets only. ▪ It is not allowed to subject to centrifugation toxic or infectious materials with damaged leak proof seals of the rotor or test-tube. Proper disinfection procedures have to be carried out when dangerous substances contaminated the centrifuge or its accessories.

	EXPLOSIVE AND COMBUSTIBLE MATERIALS ▪ It is not allowed to centrifuge explosive and inflammable materials. ▪ It is not allowed to centrifuge substances prone to reacting in result of supplying high energy during centrifugation. The centrifuge can not be operated in explosion-endangered areas ▪ It is not allowed to centrifuge materials capable of generating inflammable or explosive mixtures when subjected to air.

4.5 Maintenance conditions

	START-UP ▪ Prior to switching the centrifuge on, one shall read carefully all sections of this instruction in order to ensure smooth operation and avoid damages of this device or its accessories. ▪ In order to protect the centrifuge against unbalance, fill in the test tubes up to the same weight.
	TRANSPORTATION ▪ Centrifuge must not be transported with the rotor mounted on the shaft..
	GENERAL HINTS ▪ One must use original rotors, test-tubes and spare parts only. ▪ In case of faulty operation of the centrifuge one shall ask for assistance of service of MPW MED. INSTRUMENTS company or its authorized representatives. ▪ It is not allowed to switch the centrifuge on if it is not installed properly or rotor is not fitted correctly.

	CENTRIFUGES SUBSTANCES ▪ It isn't allowed to exceed load limit set by the manufacturer. Rotors are intended for fluids of average homogeneous density equal to **1,2 g/cm^3** or smaller when centrifugation is carried out at maximum speed. When fluids of higher density shall be used, then it is necessary to change density of centrifuges sample in **PARAM/DENSITY** field.

4.6 Safety precautions

For safety reasons, inspections of the centrifuge carried out by the authorized service at least once a year after the period of warranty. The reason for more frequent inspections could be corrosion inducing environment. Examinations should end with issuing report of validation that checks on the technical state of the laboratory centrifuge. It is being recommended to establish document where every repairs and reviews are being registered. Both these documents should be stored in the place of use of the centrifuge.

	INSPECTION PROCEDURES CARRIED OUT BY THE OPERATOR Operator has to pay special attention to the fact that the centrifuge parts of key importance due to safety reasons are not damaged. This remark is specifically important as for: ▪ Motor suspension ▪ Motor axis concentricity ▪ Fixing the pins in the bucket. ▪ Centrifuge accessories and especially structural changes, corrosion, preliminary

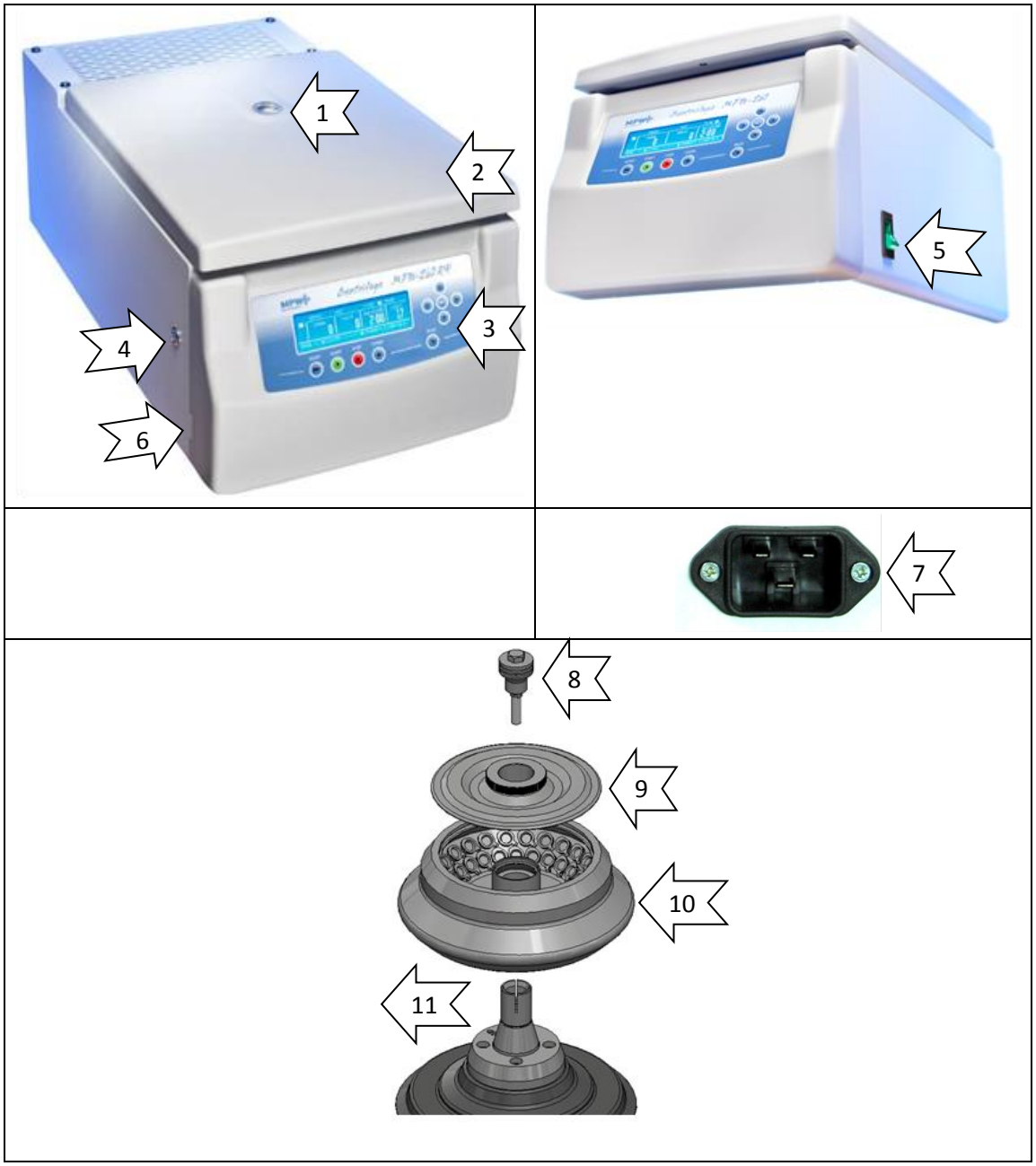
	cracks, abrasion of metal parts. ▪ Screw joints. ▪ Inspection of the rotor assembly. ▪ Inspection of bioseals of the buckets if such are used. ▪ Control of execution of the guarantee yearly technical inspection of the centrifuge Only the manufacturer-specified holders, included in the equipment list, as well as centrifuge capillaries, which diameter, length and durability are suitable, should be used for spinning in this centrifuge. The use of equipment made by other manufacturers should be consulted with the manufacturer of the centrifuge. ▪ It is not allowed to lift or shift the centrifuge during operation, and rest on it. ▪ It is nor allowed to stay in the safety zone within 30 cm distance around the centrifuge neither leave within this zone some things, e.g. glass vessels. ▪ It is not allowed to put any objects on the centrifuge.

	COVER OPENING
	▪ It isn't allowed to open the cover manually in emergency procedure when rotor is still turning.
	ROTORS
	▪ It is not allowed to use the rotors and round carriers with signs of corrosion or other mechanical defects. ▪ It is not allowed to centrifuge highly corrosive substances which may cause material impairment and lower mechanical properties of rotor and round carriers. ▪ It isn’t allowed to use rotors and accessories not admitted by the manufacturer. Let to use commercial glass and plastic test tubes, which are destined to centrifuging in this laboratory centrifuge. One should absolutely not use poor quality elements. Cracking of glass vessels and test tubes could result in dangerous vibration of the centrifuge. ▪ It is not allowed to carry out centrifugation with the rotor caps taken off or not driven tight.

5 Operating

New generation of MPW MED. INSTRUMENTS laboratory centrifuges is provided with state-of-the-art microprocessor control systems, very durable and quiet asynchronous brushless motors and accessories consistent with requirements of the present-day user.

5.1 Centrifuge description



1.	inspection glass	**7.**	mains socket (rear wall)
2.	cover	**8.**	clamp
3.	control panel	**9.**	rotor cover
4.	emerengcy cover opening	**10.**	rotor
5.	power switch	**11.**	motor axle
6.	USB port		

5.2 Design

The centrifuge has rigid self-supporting structure. Housing was made of sheet aluminium, back made of steel sheet. Front and cover was made of ABS type plastic. Cover is fixed on steel axles of hinges and from the front it is locked with two electromagnetic locks blocking possible opening during centrifugation. Rotation chamber casing was made of thick steel sheet. The rotation chamber bowl is made of stainless steel sheet. Rotors and containers are from aluminium, lids from polycarbonate and reductive inserts from the polypropylene.

5.3 Rotor and accessories installation

- Connect the centrifuge to the mains (master switch on left side of the centrifuge).
- Open the cover of the centrifuge by pressing the **COVER** key. Prior to putting the rotor in, one has to check if the rotating chamber is free of impurities, e.g. such as dust, glass splinters, residues of fluids that must be taken away.
- One shall fit the rotor on the motor shaft driving it home on the cone.

	Fitting the rotor too shallow will result in lack of identification of the rotor after start of the centrifuge, displaying the error message and stopping the centrifuge.

- Screw-in the bolt for fixing the rotor (clockwise) and screw it tightly home with the supplied spanner for the rotor.
- Swing-out rotors have to be provided with the buckets in all seats. One should remember that every buckets swings individually. Bucket suspension studs should be lubricated periodically with petroleum jelly.
- In case of rotors designed with the cover they must not be used without it. Rotor covers must be closed exactly. Rotor covers ensure smaller drags of the rotors, proper setting of the test-tubes and airtight sealing.
- One should use only buckets intended for selected types of the rotor.
- Fill test tubes outside the centrifuge.
- Put on or screw the caps on vessels and rotors (if applicable).
- In case of centrifuging in an angle rotor, test tubes (buckets) have to be filled properly in order to prevent from pouring fluids during centrifuging.

	Centrifuge will tolerate small weight differences occurring during loading of rotors. However it is recommended to equalize vessels loads as much as possible in order to ensure minimal vibrations during operation. When the centrifuge is started with large imbalance, the unbalance control system will switch-off the drive system and error signal will be transmitted. On the monitoring panel, error message will be displayed.

- In order to prolong lifetime of the rotor and gaskets rotors shall be lubricated with the maintenance oil, while gaskets and threaded parts shall be lubricated with the petroleum jelly.
- For replacement of the rotor one shall unscrew clamping and then grab the rotor with both hands at opposite sides, taking it away from drive shaft by pulling it up.

5.4 Control device

The microprocessor control unit of the centrifuge ensures broad possibilities of providing, realisation and reading of work parameters.

5.5 Setting parameters

Data setting and read-out system forms hermetically closed keyboard with distinctly accessible operation points. Easily readable displays signaling individual performed operations facilitate operator's programming and recording of parameters and condition of the centrifuge.
The centrifuge is provided with the USB interface that enables connection of the centrifuge to external PC unit with the printer and recording the centrifugation parameters.

5.6 Safety features

Cover lock

The centrifuge can be started only with properly closed cover. While, the cover can be opened only after stopping the rotor. In case of emergency opening of the cover during operation, the centrifuge will be immediately switched-off and the rotor will brake till complete stopping.

Unbalance detecting

When loads of opposite buckets or carriers in rotors are unbalanced, the drive will be switched-off during acceleration or operation of the centrifuge – and the error message will be displayed.

Rotor verification and checking compatibility with loaded progam

Directly after starting centrifuging, a unit verifies the type of the rotor applied and in the case of its incompatibility with the type indicated in the application or absence of the rotor, the spinning process shall be stopped with simultaneous displaying the error message. The conformity of the type of the rotor is signalled with a single audible signal. Program no. 99 can be run without setting rotor, but the rotor must be supported by the centrifuge.

Rest state inspection

Opening of the centrifuge's cover is possible only with the rotor in the state of rest. When the rotor is being stopped, the STOP diode is on and goes off when it is stopped. (excepting emergency cover opening) – see p. TROUBLESHOOTING.

Checking of excessive temperature

If temperature in rotation chamber exceeds 50°C (MPW-260) / 65°C (MPW-260R/RH) caused by, for example, malfunction of cooling system, drive will be switched off and error message will be displayed. The reboot is only possible after chilling device.

6 Centrifugation

Power switching ON/OFF is carried out with master switch situated on the side wall of the centrifuge. All settings on the centrifuge are done by means of the control panel.

6.1 Control panel

The control panel placed on the front casing serves the purpose of controlling centrifuge operation.

Control panel

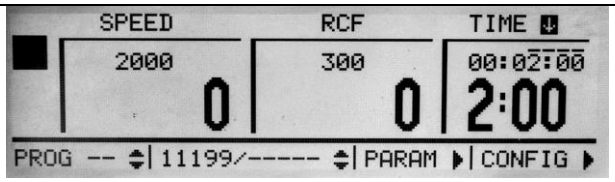
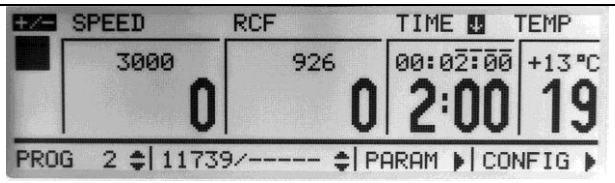
▶▶	SHORT[1]	short-time centrifuging		
▶	START	start centrifugation run		
■	STOP[2]	end centrifugation run		
	COVER	cover opening		
	BACK	back buton	/	cancelling
▲	UP	navigating in menu	/	increasing values
▼	DOWN	navigating in menu	/	decreasing values
SET	SET	changing parameters	/	confirming changes
◀	LEFT	navigating in menu	/	
▶	RIGHT	navigating in menu	/	

[1] the centrifuge is working as long as the key is pressed

[2] first-time pressing press – will make stopping centrifuging with acceleration characteristics set in the current program (confirm message with pressing **STOP** or **BACK** key), second-time pressing – will make the centrifuging as fast as possible (quickest characteristic). During setting of the parameters, it serves for exiting zones on the primary screen without introducing changes.

6.2 Display

The display is located in the centre of the control panel. The main screen variants are presented below.

MAIN SCREEN	
MPW-260	
MPW-260R/RH	

SPEED	rotor speed	assigned/measured
RCF	centrifugal force	assigned/measured
TIME	centrifuging time	assigned/measured
TEMP	temperature	assigned/measured
PROG —	program no.	
11199 / ——	rotor no.	
PARAM	parameters of the centrifuge	
CONFIG	configuration menu	

+/−	changing values		
	user acc/dec curvers (ACC/DEC 10-19)		
R!	custom radius		
ρ!	density > 1,2 g/cm^3		
	counting time down (decreasing)		counting time up (increasing)
	cooling to set temperature		heating to set temperature
	centrifuging		centrifuging (with automatic cover opening)
	rotor stopped / closed cover		rotor stopped / opened lid
	stopping rotor		fastest decelerating
i	identyfying rotor		
T	thermal chamber		
°C	temperature delay		
	time delay		
----	zone mark of assigning of the centrifuging time		

	drop-down list		
	temporairly disabled		
	locked		
	time counting (blinking)		
	disabled option / drop-down list		active option / drop-down list
	disabled option		active option

6.3 Centrifuging notes

- Connect the centrifuge to the mains (master switch on left side of the centrifuge).
- Open the cover of the centrifuge by pressing the **COVER** key. Prior to putting the rotor in, one has to check if the rotating chamber is free of impurities, e.g. such as dust, glass splinters, residues of fluids that must be taken away.
- One shall fit the rotor on the motor shaft driving it home on the cone.

	Fitting the rotor too shallow will result in lack of identification of the rotor after start of the centrifuge, displaying the error message and stopping the centrifuge.

- Screw-in the bolt for fixing the rotor (clockwise) and screw it tightly home with the supplied spanner for the rotor.
- Swing-out rotors have to be provided with the buckets in all seats. One should remember that every buckets swings individually. Bucket suspension studs should be lubricated periodically with petroleum jelly.
- In case of rotors designed with the cover they must not be used without it. Rotor covers must be closed exactly. Rotor covers ensure smaller drags of the rotors, proper setting of the test-tubes and airtight sealing.
- One should use only buckets intended for selected types of the rotor.
- Fill test tubes outside the centrifuge.
- Put on or screw the caps on vessels and rotors (if applicable).
- In case of centrifuging in an angle rotor, test tubes (buckets) have to be filled properly in order to avoid overflows.

	Centrifuge will tolerate small weight differences occurring during loading of rotors. However it is recommended to equalize vessels loads as much as possible in order to ensure minimal vibrations during operation. When the centrifuge is started with large imbalance, the unbalance control system will switch-off the drive system and error signal will be transmitted. On the monitoring panel, error message will be displayed.

- In order to prolong lifetime of the rotor and gaskets rotors shall be lubricated with the maintenance oil, while gaskets and threaded parts shall be lubricated with the petroleum jelly.

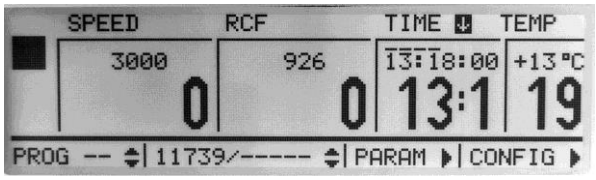
- For replacement of the rotor one shall unscrew clamping and then grab the rotor with both hands at opposite sides, taking it away from drive shaft by pulling it up.

6.4 Setting up RPM, RCF, TIME, temperature

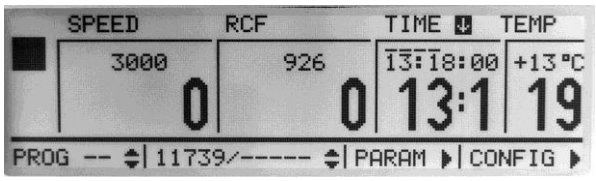
On the main screen, it is possible to set:

rotating speed	**SPEED (RPM)**
relative centrifugal force	**RCF**
centrifuging time	**TIME**
centrifuging temperature	**TEMP** (R/RH only)

Exemplary change of **SPEED** setting:

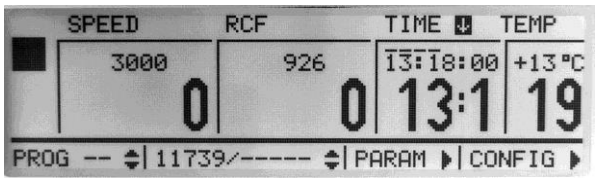
	▪ Press **SET** (to enter edit mode)**.** ▪ With ▲▼◄► keys mark **SPEED** fold (blinking).
	▪ Press **SET**. ▪ Choose demanded order of magnitude by pressing ◄►, e.g.: **3**000 (**3** - blinking). ▪ Set demanded value by pressing ▲▼**.** ▪ Repeat above two steps for other orders of magnitude. ▪ Confirm set value by pressing **SET**. ▪ Leave edit mode by pressing **BACK**.
When RPM is changed, RCF is automatically corrected.	

Exemplary change of **RCF** setting:

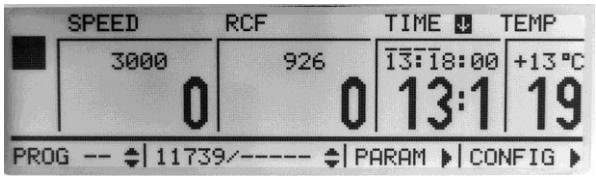
	▪ Press **SET** (to enter edit mode)**.** ▪ With ▲▼◄► keys mark **RCF** fold (blinking).
	▪ Press **SET**. ▪ Choose demanded order of magnitude by pressing ◄►, e.g.: **9**26 (**9** - blinking). ▪ Set demanded value by pressing ▲▼**.** ▪ Repeat above two steps for other orders of magnitude. ▪ Confirm set value by pressing **SET**. ▪ Leave edit mode by pressing **BACK**.

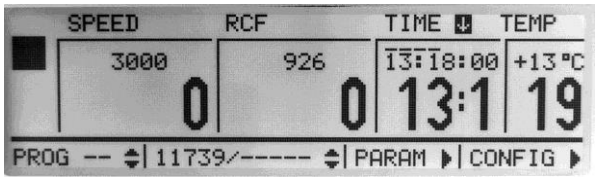
When RCF is changed, RPM is automatically corrected.

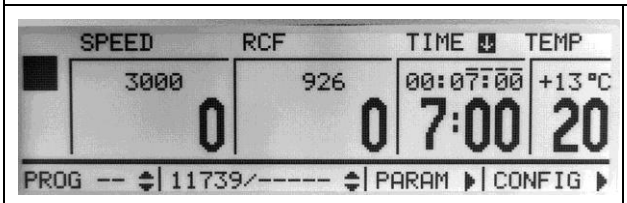
Exemplary change of **TIME** setting:

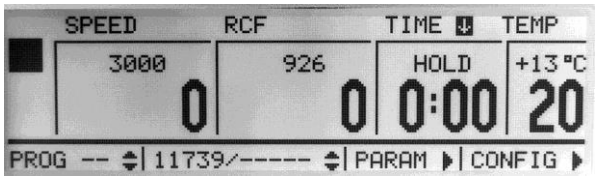
	▪ Press **SET** (to enter edit mode)**.** ▪ With ▲▼◄► keys mark **TIME** fold (blinking).
	▪ Press **SET**. ▪ Choose demanded order of magnitude by pressing ◄►, e.g.: **1**3:18:00 (**1** - blinking). ▪ Set demanded value by pressing ▲▼. ▪ Repeat above two steps for other orders of magnitude. ▪ Confirm set value by pressing **SET**. ▪ Leave edit mode by pressing **BACK**.

Exemplary change of **TEMP** setting:

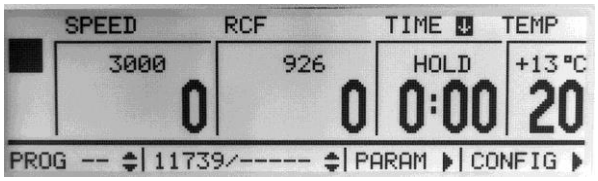
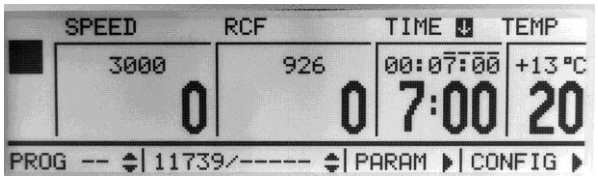
	▪ Press **SET** (to enter edit mode)**.** ▪ With ▲▼◄► keys mark **TEMP** fold (blinking).
	▪ Press **SET**. ▪ Set demanded value by pressing ▲▼. ▪ Confirm set value by pressing **SET**. ▪ Leave edit mode by pressing **BACK**.

Changing parameters during run	
	There is a possibility to change parameters: **SPEED, RCF, TIME, TEMP** during centrifuging. Such modifications give in currently running program. Modification during run is represented by **PROG —** symbol.

Detailed description of setting values (e.g. **TIME**).	
	▪ Press **SET** (to enter edit mode)**.** ▪ With ▲▼◄► keys mark **TIME** fold (blinking).
0 0 : 0 7 : 0 0 hh : mm : ss e.g.: ▪ centrifuging time – 7 minutes 00 seconds	▪ Press **SET**. ▪ Choose “hours”, “minutes” or “seconds” by pressing ◄►, e.g.: **00**:07:00 (**00** - blinking). ▪ Set demanded value by pressing ▲▼. ▪ Repeat above two steps to set demanded time. ▪ Confirm set value by pressing **SET**. ▪ Leave edit mode by pressing **BACK**.
	set value
	current calue (most significant digits)
– – – –	**–** – – – symbol shows which orders of magnitude are currently shown in current value fold

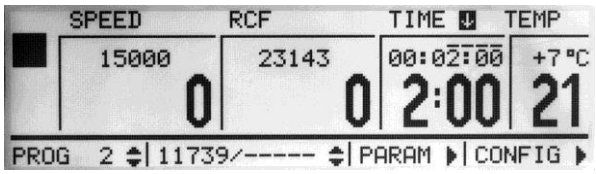
HOLD mode	continuous operation mode
	▪ To run centrifuging in HOLD mode set **00:00:00** time. ▪ To end centrifuging in HOLD mode press **STOP**.

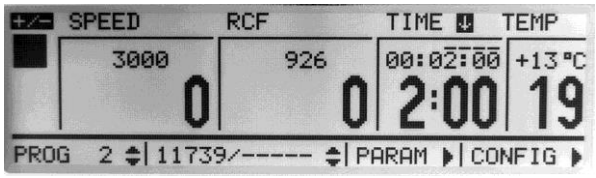
6.5 User programs

 	After switching centrifuge on, program that was used in previous session is being loaded. Modification during run is represented by **PROG —** symbol.

Choosing program:

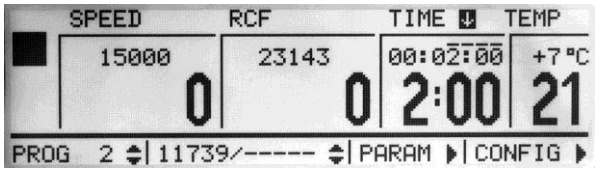
FAST MODE:

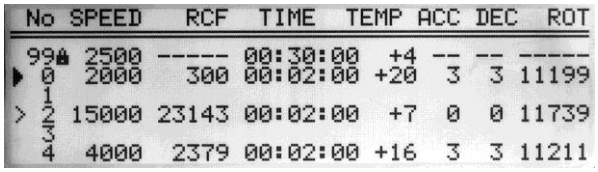




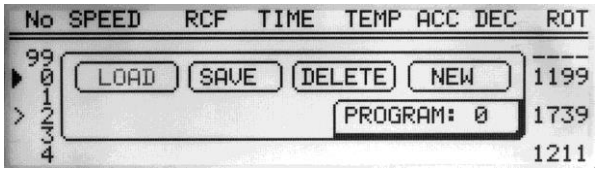
- Press **SET**.
- With ▲▼◄► keys mark **PROG** — fold (blinking). Press **SET**.
- Set demanded program by pressing ▲▼.
- Confirm by pressing **SET**.

LIST:





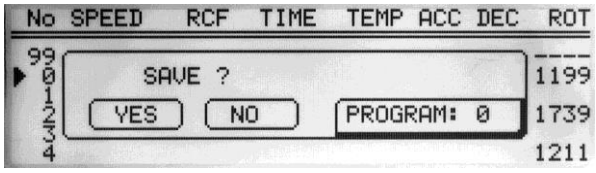
- Press **SET**.
- With ▲▼◄► keys mark **PROG** — zone.
- Press **SET**.
- With ▲▼ keys choose demanded program number. (marked by ▶).
- Confirm by pressing **SET**.



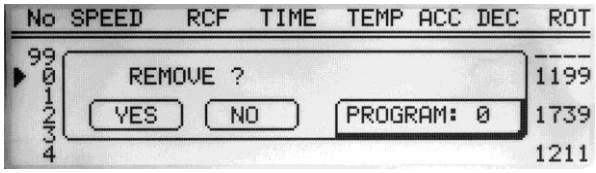
- With ▲▼ keys choose choose one of four possibilities: **LOAD, SAVE, DELETE, NEW**:

> – currently loaded program.

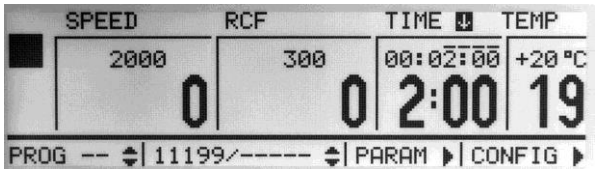
- **LOAD** – load program,



- **SAVE** – save settings as a program (confirm by selecting **YES** and pressing **SET**)



- **DELETE** – delete program (confirm by selecting YES and pressing **SET**)

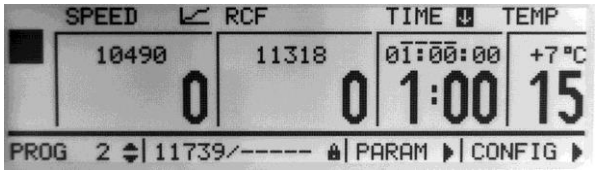


NEW – load default parameters:

- TEMPERATURE: **+20°C**,
- SPEED: **2000 RPM**,
- TIME: **2 min**.

6.6 Programs with user characteristics

Loading a modified program in the **CURVES** fold is signaled by the icon on the main screen:

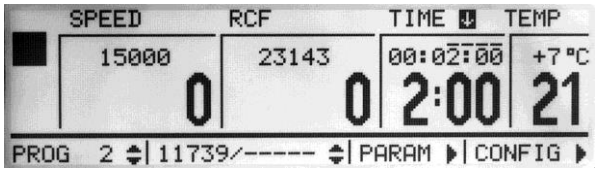
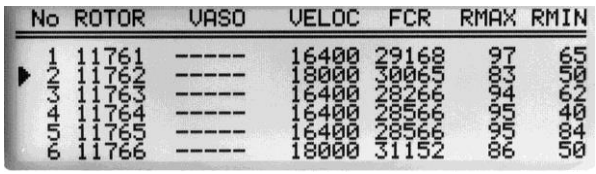
	Icon signals that program with user acceleration/deceleration characteristics are loaded.

Since curves created by the user are connected with the number of the rotor and the value of speed set, loading of a program modified in such a way is subject to certain limitations. There is no possibility to change set speed and the rotor number (even when the centrifuge is not working). It is possible to modify the number of characteristics connected with the program in the PARA fold; setting ACEL and DECEL within the range 0 - 9 switches centrifuging process to default characteristics and the limitations are no longer applicable

It is not possible to change parameters (speed, rotor no. and others) during run, when program with user characteristic is loaded. Changing these parameters is possible in **PARAM/ACEL**, **PARAM/DECEL**.

6.7 Choosing rotors

There are two ways to select rotor:

	FAST MODE
	▪ Press **SET**. ▪ With ▲▼◄► keys mark **11739 /** ——— zone. ▪ Press **SET**. ▪ With ▲▼◄► keys mark choose demanded rotor. ▪ Confirm by pressing **SET**.
	LIST
	▪ Press **SET**. ▪ With ▲▼◄► keys mark symbol. ▪ Press **SET**. ▪ With ▲▼◄► keys select rotor number. ▪ Confirm by pressing **SET**.

6.8 SHORT mode

	SHORT mode
	▪ In SHORT mode the centrifuge is working as long as the ▶▶ (SHORT) key is pressed or when set time is over.

6.9 Terminating centrifugation

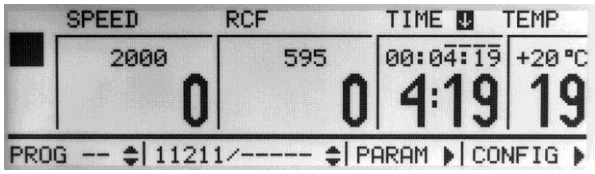
	STOPPING CENTRIFUGATION CYCLE
	▪ When preselected time is reched, centrifugation will end automatically.
x1	▪ Pressing **STOP** for the first time will stop centrifuging with the charasteristic set in loaded program. Confirm message by pressing **STOP** lub **SET**.
x2	▪ Pressing **STOP** second time will stop centrifuging with the fastest characteristic.

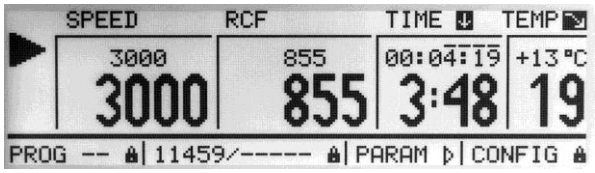
7 Temperature control

	MPW-260R/RH only

Centrifuge is equipped with ecological refrigerating system with temperature control. During centrifugation, there may appear differences in temperature on the display and temperature of the samples in the rotor. It depends on thermal conductivity of the rotor, and samples and centrifugation time.

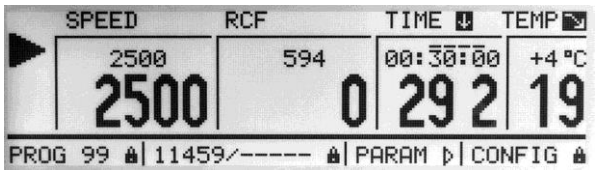
Exemplary change of **TEMP** setting:

	▪ Press SET (to enter edit mode). ▪ With ▲▼◄► keys mark **TEMP** fold (blinking). Press SET.
	▪ Set demanded value by pressing ▲▼. ▪ Confirm set value by pressing SET. ▪ Leave edit mode by pressing BACK.

	▪ When chamber is being cooled or heated, ↘ symbol is visible on the screen (blinking).

7.1 Initial cooling (R/RH) or heating (RH) with centrifuging

 90 ÷ 2500 RPM	▪ In order to centrifuge preparations of a lowered temperature (deposited in the outside refrigerator) it is necessary to make initial refrigerating of the chamber, the rotor and containers, to the set low temperature, in order to minimise the difference of temperatures ▪ Initial cooling/heating function can be activated by executing **PROGRAM 99**. Parameters: ▪ temperature, ▪ speed: **90 ÷ 2500 RPM**, ▪ time. Initial cooling/heating functions can be terminated anytime by pressing **STOP** key.

	When **cooling function** is active, ↘ / ↗ symbol is visible on the screen (blinking). When **Initial cooling** is active, **PROG 99** and arrows ↗ / ↘ are visible (blinking) in **TEMP** fold.

7.2 Initial cooling (R/RH) or heating (RH) without centrifuging – THERMAL CHAMBER

	CONFIG → **THERMAL CHAMBER**
 0 RPM	▪ There is possible to run centrifuge in THERMAL CHAMBER mode - cooling for R, cooling and heating for RH (rotor is at standstill). ▪ How to enable THERMAL CHAMBER is described in Parameters of centrifugation chapter.

7.3 Cooling (R/RH or heating (RH) in "START DELAY – OF TEMPERATURE" mode

	CONFIG → **START DELAY – OF TEMPERATURE**
 2500 RPM	▪ Centrifuging process will start, when preselected temperature is reached. ▪ How to enable run **START DELAY – OF TEMPERATURE** function is described in Parameters of centrifugation chapter.

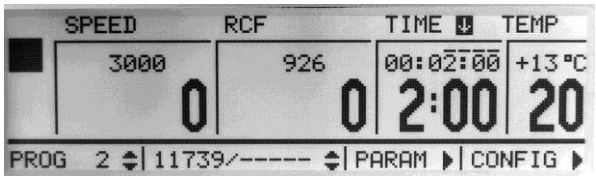
7.4 Cooling (R/RH) or heating (RH) in „SHORT" mode

	▪ Cooling and heating features are avalaible in SHORT mode. ▪ How to enable run centrifugation in **SHORT mode** is described in Centrifugation/SHORT mode.

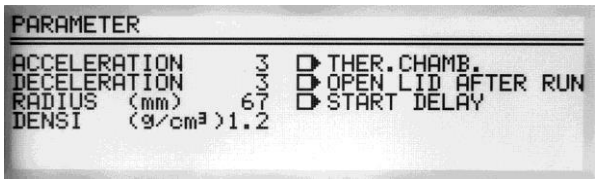
7.5 Cooling (R/RH) notes

Centrifuges with cooling (MPW-260R/RH) are equipped with an efficient cooling system. It allows obtaining selected temperatures in the chamber even at maximum spin speed or fast obtaining desired temperatures (e.g. 4^{o}C and 36^{o}C). Note that time and possibility of obtaining a set temperature is dependent on multiple factors, including: the power of the cooling system, the shape of the rotor, the rotor speed, ambient temperature, etc. The accuracy of the temperature stability of ± 1 ^{o} C is determined by the installation place of the temperature sensor.

8 Parameters of centrifugation



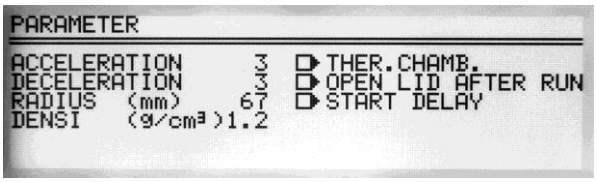
- Press **SET**.
- With ▲▼◄► keys select **PARAM**. Press **SET** (to enter PARAM menu).



ACCELERATION	chosen acc. characteristic
DECELERATION	chosen dec. characteristic
RADIUS [MM]	current rotor radius
DENSI (g/cm³)	sample density

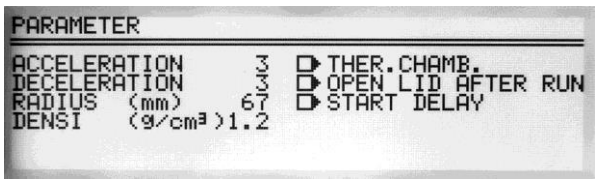
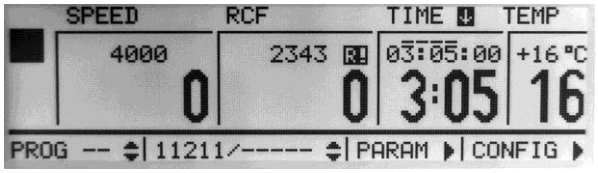
THER. CHAMB.	cooling / cooling and heating of the chamber
OPEN LID AFTER RUN	opening cover after centrifuging automatilcally
START DELAY	starting delayed (after pressing START)

8.1 Accelerating/decelerating – changing characteristics

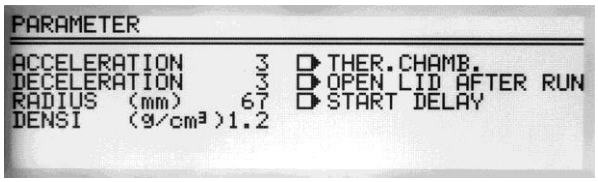
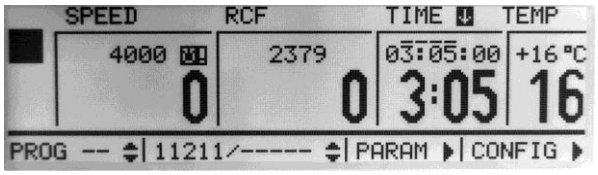


- **ACCELERATION** – 10 linear accelerating characteristics assigned to every rotor **(0 ÷ 9)**,
- **DECELERATION** – 10 linear decelerating characteristics assigned to every rotor **(0 ÷ 9)**.

8.2 Radius

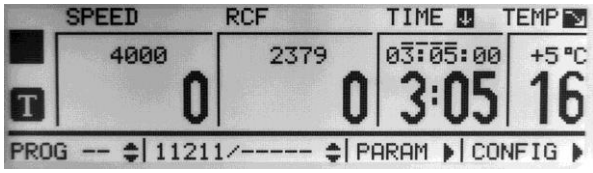
<table>
<tr>
<td> 
</td>
<td>▪ RADIUS [mm] - control of the radius of the rotor within the range from R_{min} to R_{max}. Avalaible values depends on chosen rotor, see ——— / ——— (LIST OF ROTORS fold).</td>
</tr>
<tr>
<td> 
</td>
<td>▪ When radius is changed is activated, R! symbol is visible on the screen.
▪ Reducing of the rotor radius (and the resulting change of displayed RCF value) applies until switching off the power supply of the centrifuge or setting the Rmax maximum radius once again (loading the program does not change this setting!).
▪ To change the rotor radius select RADIUS [mm] with ▲▼◄► keys. [MM]. Press SET. Set demanded value by pressing ▲▼. Press SET to accept changes.</td>
</tr>
</table>

8.3 Sample density

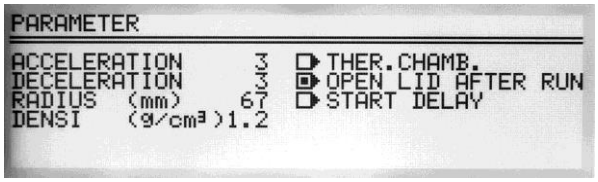
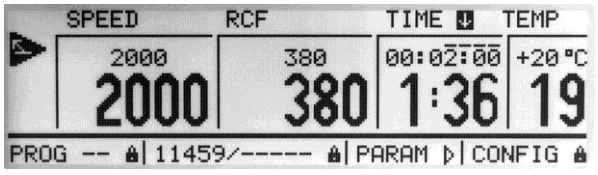
<table>
<tr>
<td> 
</td>
<td>▪ DENSI (g/cm³) – default density is set to 1,2 g/cm³ (possible values 1,2 ÷ 9,9 g/cm³).</td>
</tr>
<tr>
<td> 
</td>
<td>▪ When density is changed, D! symbol is visible on the screen.
▪ Increasing density of the sample above 1,2 g/cm³ (and limiting of the maximum speed of centrifuging resulting from it) applies until switching off power supply of the centrifuge or setting the device back to 1,2 g/cm³.
▪ To change the density select DENSI (g/cm³) with ▲▼◄► keys. [MM]. Press SET. Set demanded value by pressing ▲▼. Press SET to accept changes.</td>
</tr>
</table>

8.4 Thermal chamber

⚠	MPW-260R/RH only

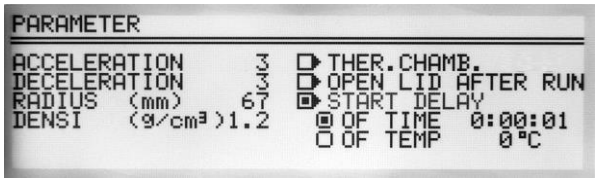
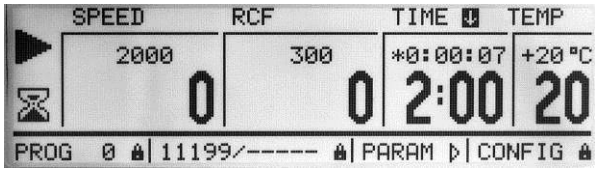
without centrifuging	**THERMAL CHAMBER**
	▪ With ▲▼◄► keys select **THERMAL CHAMBER**. Press **SET** (to turn on/off). ▪ Set demanded value by pressing ▲▼.
	▪ When THERMAL CHAMBER function is activated, T symbol is visible on the screen. ▪ Changing temperature from the main screen is not possible. ▪ Opening cover terminates THERMAL CHAMBER function (closing cover back turns it on).
▪ If THERMAL CHAMBER is turned on (in PARAM fold) and centrifugation completes, THERMAL CHAMBER will activate itself. ▪ THEMRAL CHAMBER can be only activated when any other program is not running.	

8.5 Automatic lid opening

Automatic lid opening	**OPEN LID AFTER RUN**
	▪ When centrifuge process is finished, cover will be opened automatically. ▪ When centrifuging is terminated by pressing **STOP**, opening cover is possible by pressing **COVER**.
	▪ ▶ symbol means that OPEN LID AFTER RUN is active.

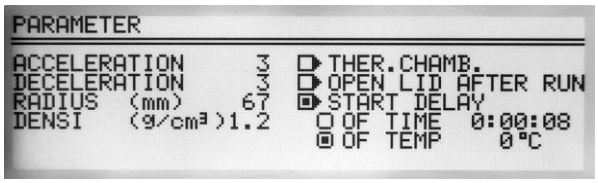
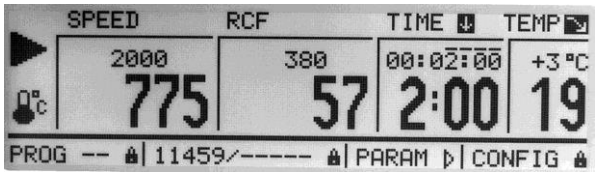
8.6 Start delay - of time

⧗	Start centrifuging since preselected delay is reached.	STARY DELAY / **OF TIME**

<table>
<tr><td> 
</td><td>▪ With ▲▼ keys select START DELAY. Press SET.
▪ Start delay can be set from 0 : 0 0 : 0 1 to 9 : 5 9 : 5 9.
▪ With ▲▼ keys select OF TIME. Press SET.
▪ Press ▼, then ► select time zone (e.g. 0 : 0 0 : 4 2).
▪ With ▲▼ keys set demanded value.
▪ Confirm by pressing SET.</td></tr>
<tr><td> 
</td><td>▪ When START DELAY function is activated, symbol is visible on the screen. symbol informs that time is remaining.</td></tr>
<tr><td colspan="2">START DELAY / OF TIME function cannot be run when START DELAY / OF TEMP. is activated.</td></tr>
</table>

8.7 Start delay – of temperature

<table>
<tr><td> </td><td>MPW-260R/RH only</td></tr>
</table>

<table>
<tr><td>
</td><td>Start centrifuging since preselected temperature is reached.</td><td>START DELAY / OF TEMP.</td></tr>
<tr><td colspan="2"> 
</td><td>▪ With ▲▼ keys select START DELAY. Press SET.
▪ With ▲▼ keys select OF TEMP. Press SET.
▪ With ◄► keys select temperature zone.
▪ With ▲▼ keys set demanded value.</td></tr>
<tr><td colspan="2"> 
</td><td>▪ When START DELAY – OF TEMPERATURE is turned on, symbol is visible on the screen. / (blinking) symbols means that temperature is increasing / decreasing.</td></tr>
<tr><td colspan="3">When function is active, rotor is rotating with 2500rpm or lower (in order of fast temperature reaching).</td></tr>
<tr><td colspan="3">START DELAY / OF TEMP. function cannot be run when START DELAY / OF TIME is activated.</td></tr>
</table>

8.8 Errors

<table>
<tr><td colspan="2">End of centrifuging – manual mode</td></tr>
<tr><td>
</td><td>Centrifuging may be stopped at the any moment with the STOP key. The information message will be displayed.</td></tr>
<tr><td colspan="2">End of centrifuging – normal mode</td></tr>
<tr><td>
</td><td>Stopping centrifuging in accordance with the set time causes generating 3 short audible signals (after stopping the rotor) and displaying the message.</td></tr>
<tr><td colspan="2">Additional messages</td></tr>
<tr><td>
</td><td>In case of power shortage while centrifuging, after repeated switching it on, the following error screen will be displayed.</td></tr>
<tr><td>
</td><td>After operating for 2000 hours, after every switching on the centrifuge the error screen is being displayed with information about the necessity to carry out servicing activities.
After pressing the SET key, the device proceeds to the main screen and the device may operate.</td></tr>
<tr><td>
</td><td>Identified number of the installed rotor. If the rotor is unknown the "--?--" sign is being displayed.</td></tr>
<tr><td>
</td><td>Decelarating.</td></tr>
<tr><td colspan="2">After pressing SET or STOP, the device returns to the main screen.</td></tr>
</table>

Other messages	An irregularity in operations of the centrifuge is signalled by displaying a screen with relevant message (a sound signal is also emitted).

'==========

SPEED OF ROTOR IDENTIFICATION <> 90 RPM

'==========

"SPEED OF ROTOR "
"IDENTIFICATION <> 90 RPM"

'==========

UNBALANCE DETECTED

'==========

"IMBALANCE FAST STOP !"
"PLEASE REMOVE CAUSE"
"THEN RESTART"

'==========

ERROR OF ROTOR IDENTIFICATION {LIMIT OF 6SEC. IS OVER}

'==========

"NO ROTOR OR IDENTIFICATION"
"SENSOR DAMAGED !"

'==========

ROTOR'S IDNOT CORRECT

'==========

"INCORRECT ROTOR NUMBER !"

'==========

WRONG DIRECTION OF ROTATION / UNKNOWN ROTOR

'==========

"WRONG DIRECTION OF ROTATION"
"OR UNKNOWN ROTOR !"

'==========

CLOSING THE LID MANUALLY

'==========

"PLEASE CLOSE THE LID"
"HAND !"

'==========

INITIALIZING AFTER MAINS FAILURE WITH ROTATING ROTOR

'==========

"ROTOR STOPPING !"
"Please wait..."

'==========

CENTRIFUGING ENDED BECAUSE OF PRESSING STOP

'==========

" CYCLE'S ABORTED !"

'==========

CENTRIFUGING ENDED {WITROUT ERRORS}

'==========

" CYCLE'S FINISHED"

Emergency messages	In case of emergency messages (centrifuge is not woking properly) contact the manufacturer's authorized service center.

```
================================================================================
INVERTET ERROR, INVERTER NOT READY {BETRIEBSBEREIT=1}
'================================================================================
"OVERHEATING MOTOR !"
"INVERTER ERROR !"
 "ERROR=" ; Error code

'================================================================================
COMMUNICATION ERROR CONTROLLER - INVERTER  {BLOK 1}
'================================================================================
"INVERTER SERIAL BUS ERROR !"
 "ERROR=" ; Error code

'================================================================================
TEMP. METER ERROR: DS18B20
'================================================================================
"TEMPERATURE SENSOR ERROR"
 "ERROR=" ; Error code

'================================================================================
PRESSURE REGULATOR ERROR
'================================================================================
 "PRESSURE CONTROL FAILURE!"

'================================================================================
COVER OPENED DURING RUN
'================================================================================
"OPENING COVER in RUN!"

'================================================================================
SPEED METER ERROR {NO IMPULSES }
'================================================================================
"SPEED METER ERROR"

'================================================================================
SEQUENCE OF 3 I2C TRANSMISSIONS FAULT;
'================================================================================
"I2C BUS ERROR"
 "ERROR=" ; Error code

'================================================================================
CENTRIFUGE OVERHEATED; CENTRIFUGE TEMPERATURE >= +50/+65 oC
'================================================================================
"OVERHEATING CENTRIFUGE !"
 "Temp.= +" ; _overheating_temp._off ; " oC"

'================================================================================
'V>VOGR_ROTOR ; ROTOR OVERSPEED {VOGR_ROTOR=VMAX_ROTOR+DELTA_VMAX}
'================================================================================
"ROTOR OVERSPEED !"

================================================================================
COVER LOCK FAILURE
'================================================================================
"COVER LOCK MALFUNCTION !"

'================================================================================
SERVICE NEEDED; TIME {2000 HOURS}
'================================================================================
"WORKING 2000 HOURS:"
 "CALL SERVICE FOR"
```

8.9 Temporarily disabled functions

Functions written below can be temporarily disabled.

	SPEED	RCF	TIME	TEMP	PROG —	——— / ———	PARAM
THERMAL CHAMBER	●	●	●	○	●	●	●

During run

	SPEED	RCF	TIME	TEMP	PROG —	——— / ———	PARAM
PROG 99	○	○	○	○	○	○	○
ACC/DEC 10-19	○	○	●	●	○	○	●

Standstill

	SPEED	RCF	TIME	TEMP	PROG —	——— / ———	PARAM
PROG 99	○	○	○	○	●	○	○
ACC/DEC 10-19	○	○	●	●	●	○	●

● available
○ disabled

8.10 Unbalance

The centrifuge is provided with the rotor unbalance sensor and when it will be activated, centrifugation process will be stopped through fast braking and at the same time an error message will be displayed. Cancellation of this error is possible only through pressing **COVER** key after stopping of the rotor.

One must check if rotor was correctly loaded, close the cover and once more start the program. In order to protect the rotor against beating in opposite areas of the rotor, it has to be provided with identically filled buckets, carriers, test-tubes etc. for getting the best balance possible.

Unbalance causes noise and vibrations during operation, and adversely affects power transmission system (motor, shock absorbers). The better balance, the smoother will be the centrifuge operation and therefore longer life of usage of the driveline. Moreover, the ideal separation level is then obtained, as already separated constituents would not be moved up by vibration.

Emergency stop

In any moment of centrifuging it is possible interrupt the process and fast stop the rotor. Single-time pressing of the STOP key will make centrifuging stop with acceleration characteristics set in the program (after pressing the SET or STOP key, the device returns to the main screen). Pressing and holding it up to 1s will make the centrifuging stop with the most strict characteristic.

8.11 Printing report - USB

When the centrifuging process is finished there is a possibility to obtain report. Report can be transferred to PC or printed. Devices that offer printing reports are available optionally and they are not delivered with every centrifuge.

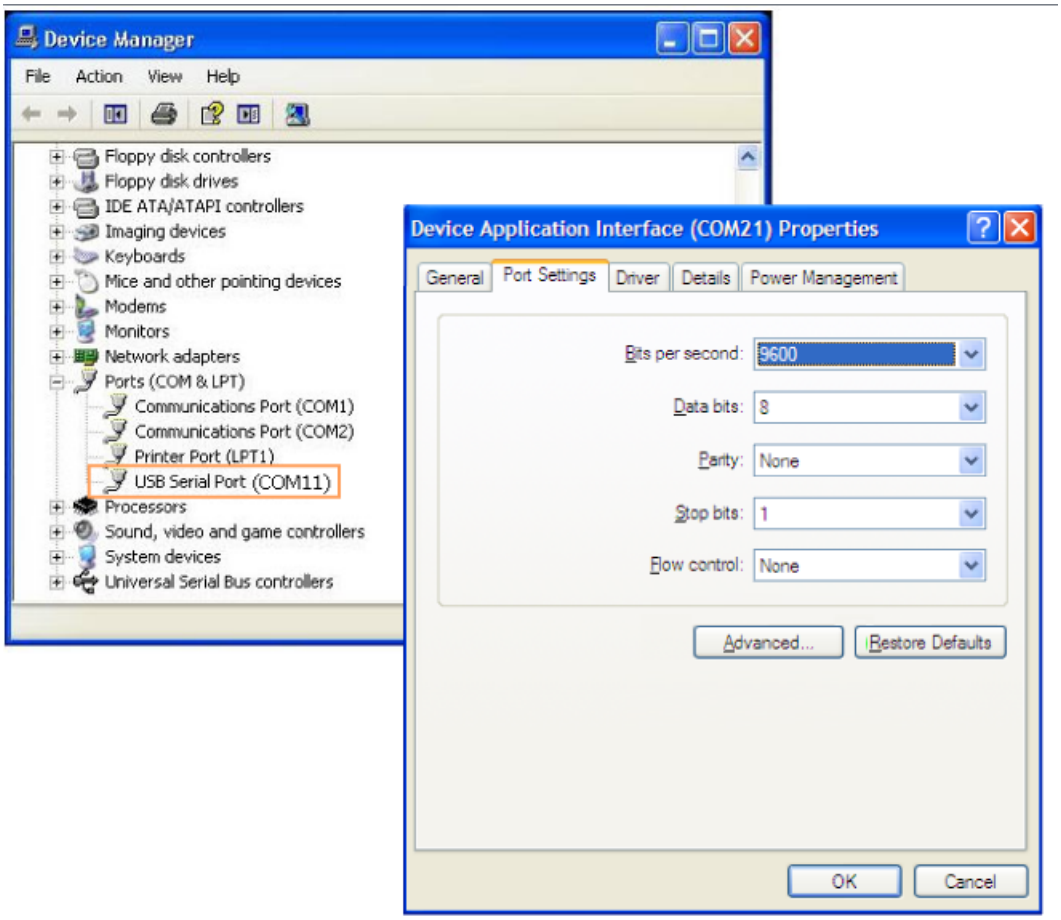
PC (USB)

name	quantity (pcs.)	cat. no.
USB A-A cable	1	16598
CD (MPW Editor application + FTDI USB drivers)	1	

USB

Preparation

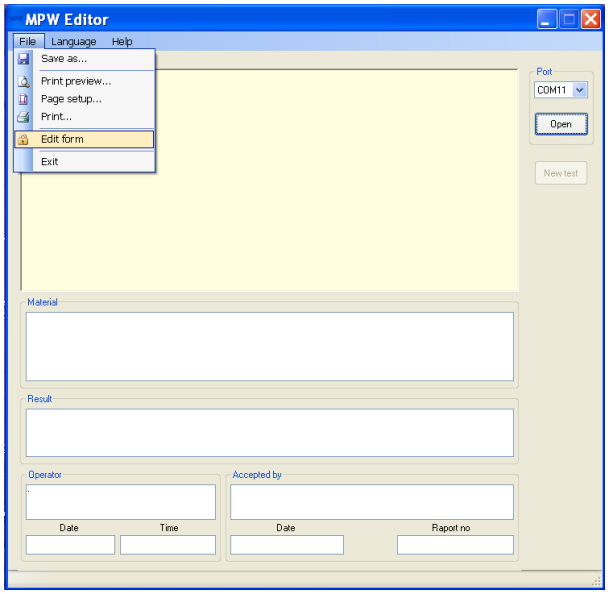
- Connect centrifuge to the PC with the USB A-A cable (connection diagram is given below).
- if necessary install FTDI USB drivers (for details see attached CD).
- Ensure that virtual serial port **COM** (USB Serial Port) settings are set as described below (run control panel/system/ **device manager**):
  - Baud rate = 9600
  - Data length = 8
  - Parity = none
  - Stop bite = 1
  - Flow control = none



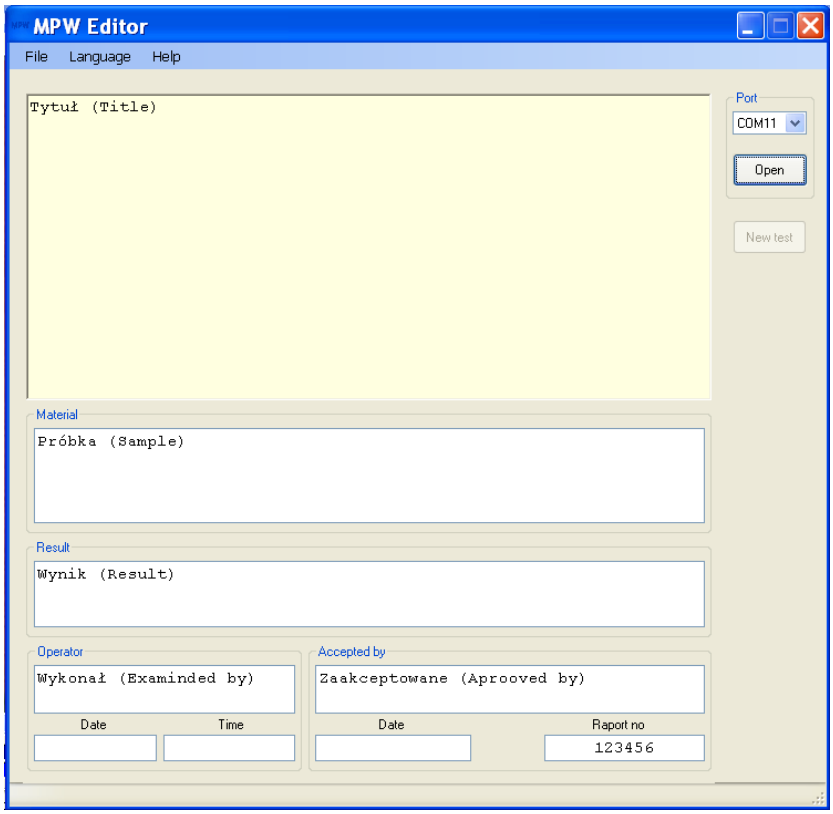
- Install MPW Editor application (Windows) delivered on CD.

Centrifuging and printing report

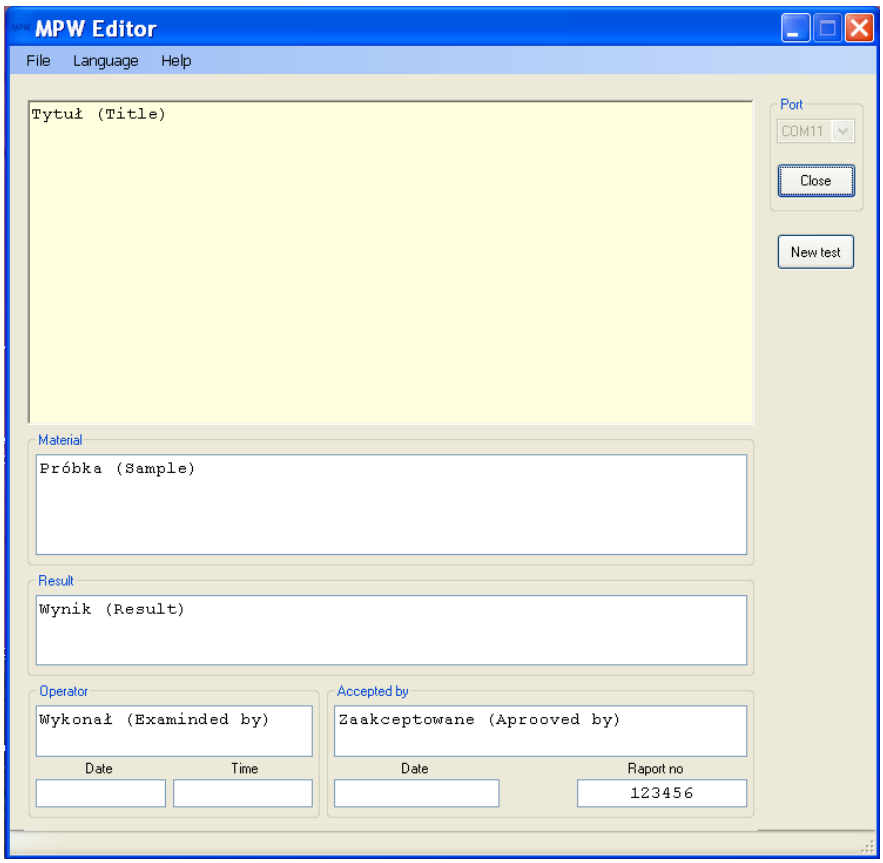
- Run **MPW Editor** application.
- Choose **Język\English**
- Choose **COM** port assigned to the centrifuge (it will appear after connecting USB cable, e.g. COM11).
- Choose **File\Edit form**



- Fill individual folds (**optionally**).
- In the folds with explerary caption „Tytuł (Title)", there is a possibility to paste form system clipboard any picture (e.g. company logo).



- Choose **File\Save form**
- Choose **Open**



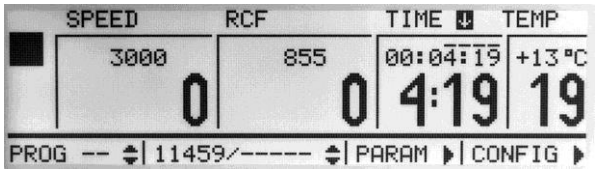
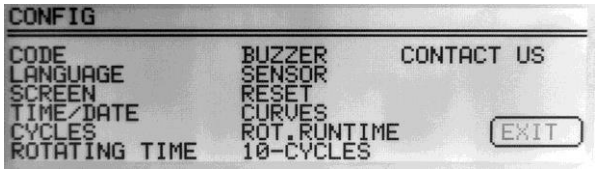
- Start centrifuging.
- When centrifuging process is completed, report will appear. Save report (File/Save us or print it (File/Print).
- In order to get another report, press **New test.**

Connection diagram

CENTRIFUGE (left-bottom corner)

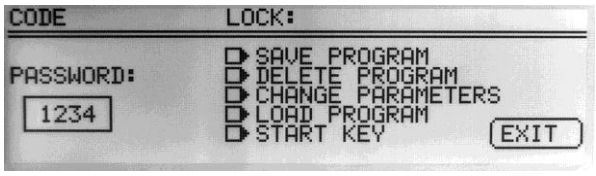
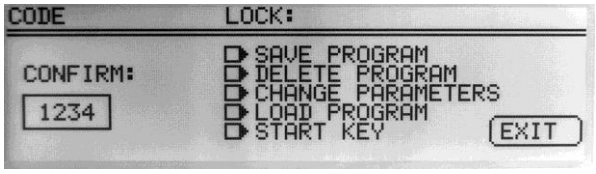
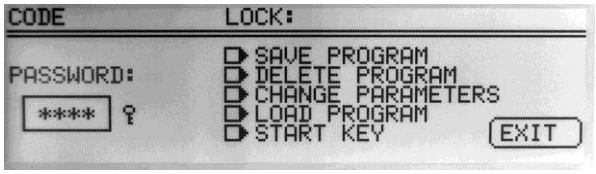
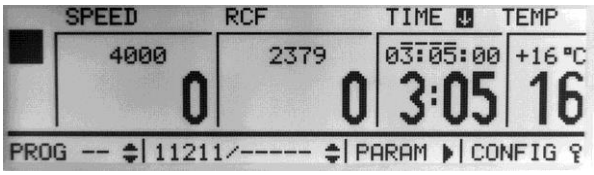
   USB port	►	 USB cable	►	 PC

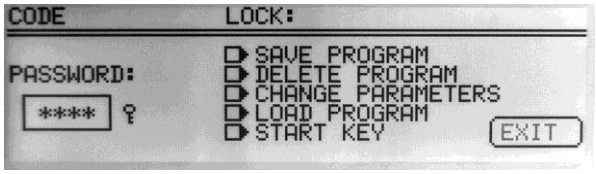
9 Configuration

	▪ Press **SET**. ▪ With ▲▼◄► keys select **CONFIG** menu. Press **SET**.
	▪ To navigate in **CONFIG** use ▲▼◄► keys. To enter CONFIG menu press **SET**.

CODE	password protection
LANGUAGE	menu language
SCREEN	main screen modes
TIME/DATE	time and date settings
CYCLES	total working time, working cycles counter
ROTATING TIME	counting time mode
BUZZER	system sounds
SENSOR	error codes
RESET	restore factory settings
CURVES	user characteristics (ACC, DEC)
ROT. RUNTIME	total running time
10-CYCLES	10 last centrifugation cycles history
CONTACT US	manufacturer’s details

9.1 Password protection

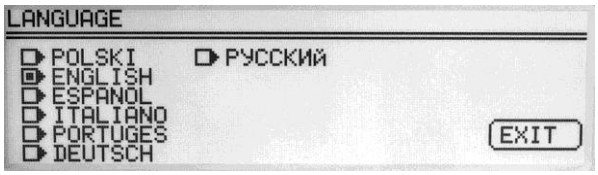
<table>
<tr><td>Setting up password</td><td>CONFIG / PASSWORD</td></tr>
<tr><td colspan="2">To prevent from an unauthorized use, a PASSWORD can be set.
Note: No PASSWORD is set by default.
The PASSWORD can be set as follows when the rotor is at a standstill.</td></tr>
<tr><td> 
</td><td>▪ Press the ◄► keys until “PASSWORD:” blinks. Press SET.
▪ With ◄► keys set the valid 1000s place of the PASSWORD. e.g.: 1xxx. With ▲▼ keys set correct value.
▪ Repeat above steps for all places.
▪ Press SET.</td></tr>
<tr><td> 
</td><td>▪ As a confirmation repeat instructions described above.</td></tr>
<tr><td colspan="2">When the PASSWORD is set, the Key sign is displayed in the CODE zone. It is also displayed in the main menu (lower right corner of the screen).</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">From this moment CONFIG menu is protected.</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">To delete the PASSWORD, “0000” must be set.
If the PASSWORD is forgotten, the emergency code “7654” should be used to clear password and remove all locks.</td></tr>
</table>

Setting up locks	
	▪ With ▲▼ keys choose a lock. ▪ Mark a lock by pressing **SET**. ▪ Repeat above steps for desired locks. ▪ Leave menu with **BACK** key.

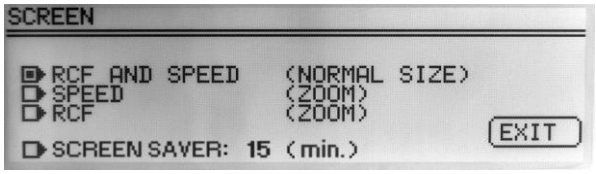
	Disabled*	**description**
SAVE PROGRAM	**SAVE** button	▪ no programs can be saved ▪ acceleration charactristics can not be saved ▪ deceleration charactristics can not be saved
DELETE PROGRAM	**DELETE** button	▪ no programs can be deleted ▪ saving programs on position where one was already stored is disabled
CHANGE PARAMETERS	fields: **SPEED** **RCF** **TIME** **TEMP** **PROG—** **——— / ———** **PARA** **CURVES**	▪ parameters can not be modified
LOAD PROGRAM	**LOAD** button	▪ no programs can be called up
START KEY	**START** key	▪ centrifugation can not be started

* Executing disabled procedures is only possible after entering the correct

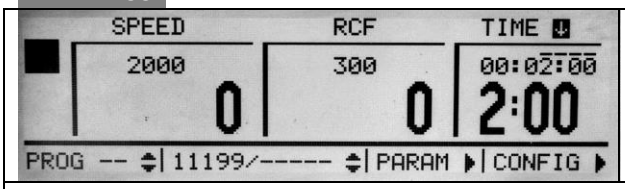
9.2 Language

Choosing menu language.	CONFIG / **LANGUAGE**
	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing **SET**.

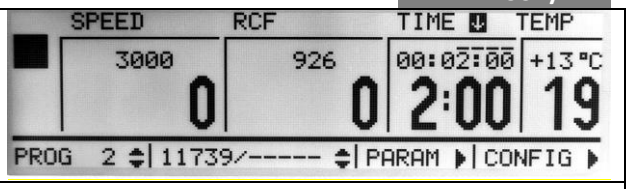
9.3 Main screen modes, screen saver

Choosing main screen mode.	CONFIG / **SCREEN**
	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing **SET**. ▪

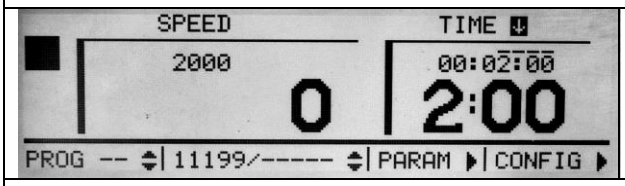
MPW-260

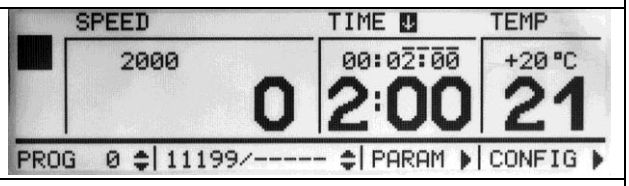


MPW-260R/RH

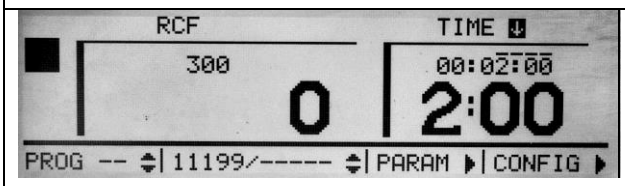


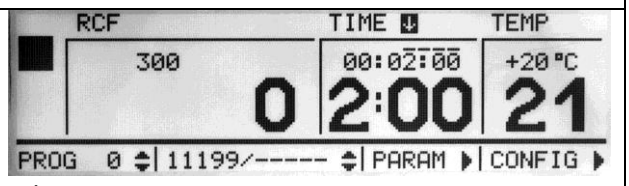
SPEED and **RCF**





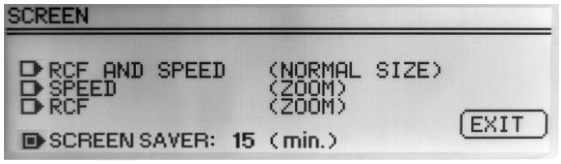
SPEED only



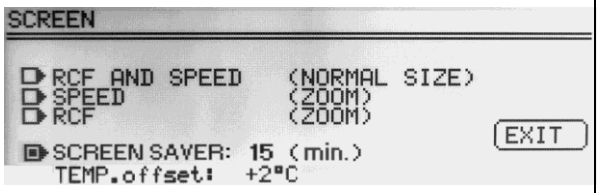


RCF only

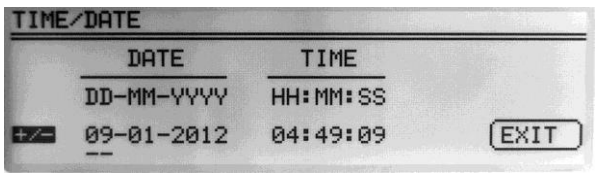
9.4 Screen saver

Setting time of screen saver	CONFIG / **SCREEN**
	▪ To activate screen saver setting, select screen saver option and press ► ▪ With ▲▼ keys select demanded value from 1 to 60 minutes. ▪ Mark selection by pressing **SET**.

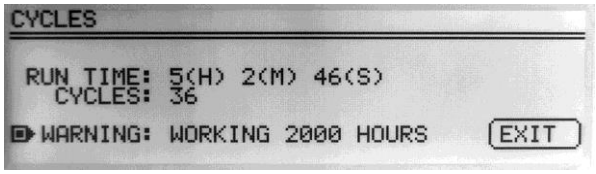
9.5 Temperature offset

	MPW-260R/RH only
Temperature offset	CONFIG/ **SCREEN MODE**
	▪ With ▲▼ keys choose **TEMP. offset** ▪ Press ► ▪ With ▲▼ keys choose difference between the set temperature, and the temperature which cooling system try to reach

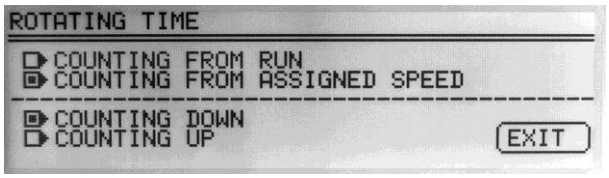
9.6 Time/date

Setting the time and date.	CONFIG / **TIME/DATE**
	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing **SET**. ▪ With ▲▼ keys select **DATE TIME** (blinking). Press **SET**. ▪ With ◄► keys place _ _ under demanded value. Press **SET**. ▪ With ▲▼ keys change selected value. Accept changes by pressing **SET**. ▪ Repeat above steps for other values. ▪ Choose **EXIT**.

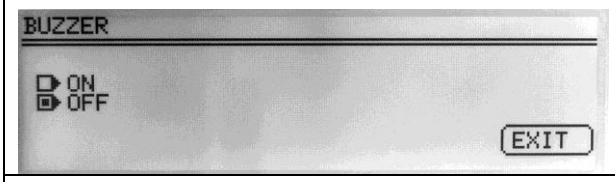
9.7 Total working time

Total working time of centrifuge	CONFIG / **CYCLES**
	In the CYCLES menu the following statistics are displayed: ▪ total working (centrifugation) time ▪ working cycles counter When the total working time is greater than **2000h**, the warning splash screen will be displayed every time the centrifuge is switched on. In case the centrifuge should be examined by the manufacturer's service. Warning message can be disabled. In order to it follow the instructions below: ▪ With ▲▼ keys choose WARNING: WORKING 2000 HOURS. ▪ Press **SET** until ⧈ disappears. ▪ Choose EXIT. The CYCLE WARNING MESSAGE is turned on by default.

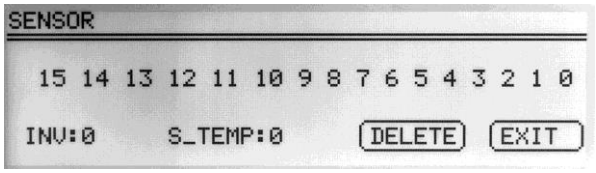
9.8 Rotating time

Counting time mode	CONFIG / **ROTATING TIME**
	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing **SET**.
Counting since:	
▪ **START** key is pressed	COUNTING SINCE ROTOR IS IDENTIFIED
▪ preselected speed is reached	COUNTING FROM ASSIGNED SPEED
Presenting mode:	
▪ remaining time	COUNTING DOWN
▪ left time	COUNTING UP

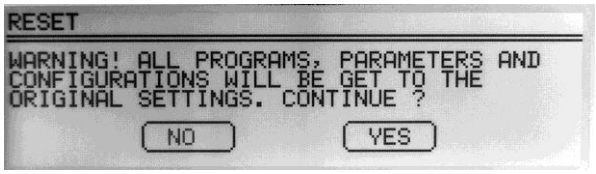
9.9 Sounds

Switching ON/OFF short audible signals accompanying every pressing of any key.	CONFIG / **SOUNDS**
	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing **SET**.
Warning signals connected with error occurrence, cannot be switched off.	

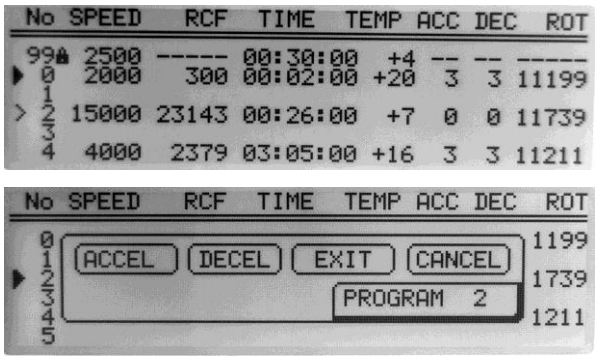
9.10 Error codes

Information about errors arisen in working of the centrifuge.	CONFIG / **SENSOR**
	Intended for service purposes!
	▪ In any moment, it is possible to delete the contents of the fold. ▪ For this purpose, choose **DELETE** button (blinking when marked) and confirm by pressing **SET** key.

9.11 Factory settings

Restoring factory setings.	CONFIG / **RESET**
All menu settings will be restored to ita original values.	
	▪ With ▲▼ keys select **YES** or **NO**. ▪ Confirm by pressing **SET**.

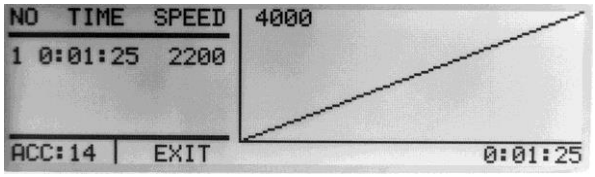
9.12 User characteristics ACCEL/DECEL

User **acceleration/deceleration** characteristics	CONFIG / **CURVES**
	▪ Choose the program by pressing ▲▼ keys. Press **SET.** ▪ To edit a**cceleration** characteristic choose **ACCEL** (by pressing ◄►)**.** Confirm selection by pressing **SET**.

Acceleration characteristic	CONFIG / CURVES / **ACCEL**

After choosing **CONFIG → CURVES → ACEL** the window of the characteristics wizard will be displayed:

Current acceleration characteristic connected with the loaded program will be displayed on the screen.



NO.	section no. (max. 4)
TIME	total acceleration time
SPEED	final RPM
ACC:11	characteristic's no. (10-19)

In the first moment, the EXIT field is marked (the message is blinking). Pressing the SET key will cause returning to the CONFIG / CURVES fold, without making changes in the acceleration characteristics.

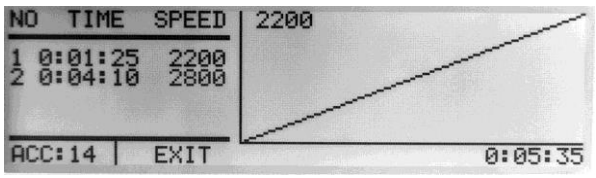
„1" SECTION

After setting the time the device will proceed to setting the speed of the given section of characteristics (only the set value SPEED blinks). With UP and DOWN keys one should set the speed value and press the SET key.

The set speed value is limited by the maximum speed of the rotor connected with the edited program. After the end of programming the speed, the graphical displaying of the section (of all sections) will occur TIME+SPEED of the user's acceleration characteristics.

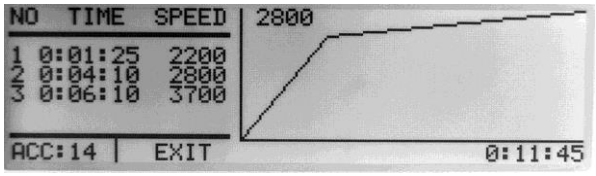
After programming the section 1, there is a possibility to program the next section, number 2:

„2" SECTION

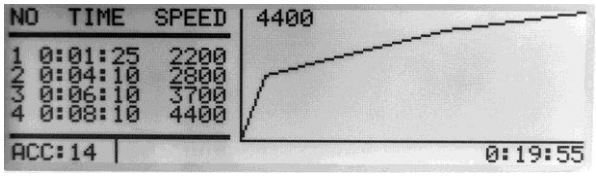
	Programming of new section possible (the whole line 2 is blinking). Programming as in the case of section 1. It is possible also to abandon the programming: with UP/DOWN keys choose the EXIT option (it will blink) and save (press the SET) only the acceleration characteristics of 1 section with TIME/SPEED parameters described in the line 1.

The minimal speed of the next section of acceleration characteristics is equal to the speed of the already programmed previous section.

„3" SECTION

	Programming of new section possible (the whole line 3 is blinking). Programming as in the case of section 1. It is possible also to abandon the programming: with UP/DOWN keys choose the EXIT option (it will blink) and save (press the SET) only the acceleration characteristics of 2 section with TIME/SPEED parameters described in the line 1 and 2.

„4" SECTION

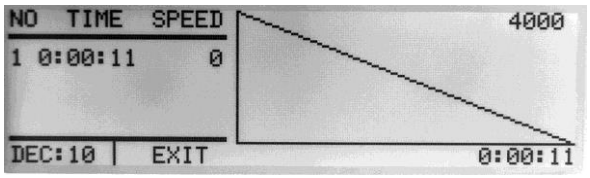
	Programming of new section possible (the whole line 4 is blinking). Programming as in the case of section 1. It is possible also to abandon the programming: with UP/DOWN keys choose the EXIT option (it will blink) and save (press the SET) only the acceleration characteristics of 3 section with TIME/SPEED parameters described in the line 1, 2 and 3.

Repeated attempt to program already programmed sections of the acceleration characteristics will cause beginning of programming of the whole acceleration characteristics once again (with settings of the program loaded to edition.

Deceleration characteristic	CONFIG / CURVES / **DECEL**

After choosing **CONFIG → CURVES → DECEL** the window of the characteristics wizard will be displayed:

Default deceleration characteristics connected with the loaded program will be displayed on the screen. Creating of deceleration characteristics takes place a little differently than acceleration characteristics.



NO.	section no. (max. 4)
TIME	total acceleration time
SPEED	final RPM
DEC:11	characteristic's no. (10-19)

In the first moment, the EXIT field is marked (the message is blinking). Pressing the SET key will cause returning to the CONFIG / CURVES fold, without making changes in the deceleration characteristics.

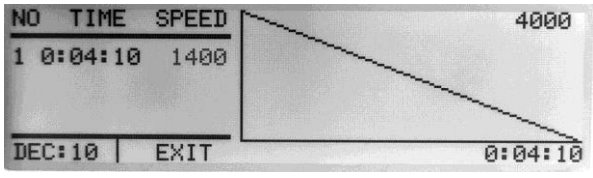
„1" SECTION

To edit the deceleration characteristics, one should mark the section of characteristics with UP or DOWN key (the whole TIME+SPEED line will begin to blink; at this stage, it is only one section, with the number 1) and then press the SET key. The device will proceed to setting the characteristics' section time (only the set TIME value is blinking). With UP and DOWN keys, one should set the required time value and press the SET key.

In order to compete the creation of the deceleration curve it is necessary for the speed of the last of programmed sections of the curve to be equal = 0. Otherwise the curves wizard will not enable the end of programming (it will be impossible to select the EXIT option).

After programming the section 1, there is a possibility to program the next section, number 2:

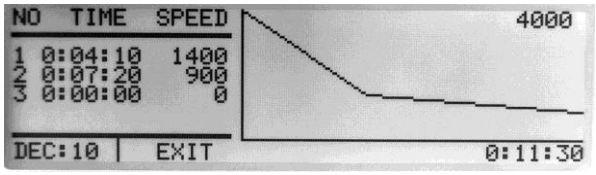
„2" SECTION



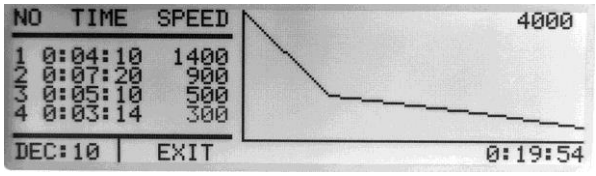
New section programming possible (the whole line 2 is blinking). Programming as in the case of the section 1. To stop creating the deceleration curve at the stage of two sections, it is necessary to set the speed in section 2 to 0 and press the SET key.

The maximum speed of the next section of deceleration characteristic is equal to the speed programmed already of the previous section.

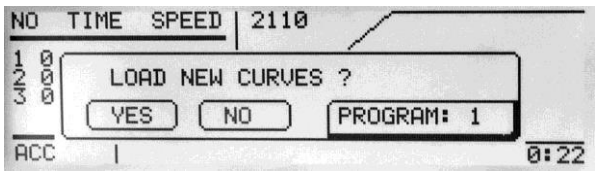
„3" SECTION

	New section programming possible (the whole line 3 is blinking). Programming as in the case of the section 1. To stop creating the deceleration curve at the stage of three sections, it is necessary to set the speed in section 3 to 0 and press the SET key.

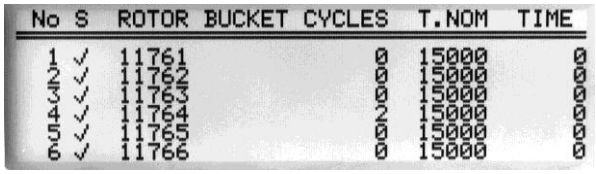
„4" SECTION

	New section programming possible (the whole line 4 is blinking). Programming as in the case of the section 1. If speed of the last section=0, it is possible to save the created characteristics by choosing the EXIT option with UP/DOWN keys and pressing the SET key.

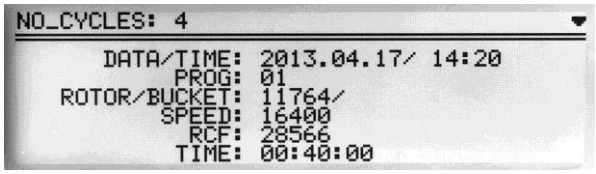
Repeated attempt to program already programmed sections of the acceleration characteristics will cause beginning of programming of the whole deceleration characteristics once again (with settings of the program loaded to edition).

	In case of continuing work with currently loaded program with new user characteristics, user should choose YES (to load new characteristics).

9.13 Rotor runtime

Information about the time of centrifuging and of the quantity of the working cycles of each rotor.	CONFIG / **ROT. RUNTIME**
	▪ The list can be scrolled using ▲▼ keys. ▪ To exit press **SET/BACK** key. The table also contains icons warning of the duty of execution of validation. ✓ – more than 100 cycles left !✓ – less than 100 cycles left ! – worn rotor

9.14 Cycles history

Information concerning parameters of ten last centrifuging cycles.	CONFIG / **10-CYCLES**
	▪ Number od cycle can be changed by ◄► keys. ▪ The list can be scrolled using ▲▼ keys. ▪ To exit press **SET/BACK** key.

9.15 Manufacturer's details

Information about the type of the centrifuge, firmware version, and contact details.	CONFIG / CONTACT US
	▪ The list can be scrolled using ▲▼ keys. ▪ To exit press **SET/BACK** key.

10 Maintenance

10.1 Cleaning of the centrifuge

	▪ For cleaning, water with soap or other water soluble **mild detergent** shall be used. One should avoid corrosive and aggressive substances. ▪ It is prohibited to use alkaline solutions, inflammable solvents or agents containing abrasive particles. ▪ Using wiping cloth, remove condensate or residues of the products from the rotor chamber. It is recommended to keep the cover opened when the centrifuge does not work in order to expel the moisture.
	▪ In case the user decides to use centrifuge and equipment cleaning methods other than the ones described in this manual, the user shall contact the device manufacturer in order to check whether the cleaning method chosen does not damage the device.

10.2 Maintenance of centrifuge elements

	▪ The rotor pins shall be always lubricated with petroleum jelly. ▪ In this way, the uniform deflection of the buckets and quiet centrifuge operation is ensured.

Cleaning of the accessories

	▪ In order to ensure safe operation one shall carry out in **regular** way periodical maintenance of the accessories. ▪ Rotors, buckets and round carriers have to withstand high stresses originating from the centrifugal force. Chemical reactions as well as corrosion (combination of variable pressure and chemical reactions) can cause destruction of metals. Hard to observe surface cracks increase gradually and weaken material without visible symptoms. ▪ In case of observation of surface damage, crevice or other change, as well as the corrosion, the given part (rotor, bucket, etc.) shall be immediately replaced. ▪ In order to prevent corrosion one has to clean regularly the rotor with the fastening bolt, buckets and round carriers. ▪ Cleaning of the accessories shall be carried out outside of the centrifuge **once every week** or still better after each use. ▪ Then, those parts shall be dried using soft fabric or in the chamber drier at ca.

	50°C. ▪ **Especially prone to the corrosion are parts made of aluminium**. For cleaning them one should use neutral agent of pH value 6÷8. ▪ It is forbidden to use alkaline agent of **pH > 8**. ▪ In this way, the useful service life of the device is substantially increased and susceptibility to corrosion is diminished. ▪ Accurate maintenance increases the service life as well and protects against premature rotor failures. ▪ Corrosion and damages resulting from insufficient maintenance could not be subject of claims lodged against the manufacturer.

Lubrication

	▪ The rotor pins shall be always lubricated with **petroleum jelly**. ▪ In this way, the uniform deflection of the buckets and quiet centrifuge operation is ensured. ▪ **HS** accessories maintenance. ▪ Make sure that rubber O-rings are lightly coated with silicone grease. Use high vacuum grease, e.g. type „C" by LUBRINA.

10.3 Sterilization

One can use all standard disinfectants. The centrifuges and accessories are constructed from various materials and one should to take into account possible variety of materials. During sterilization by means of steam one should to consider temperature resistance of individual materials.

STERILIZATION

	sterilization * 121°C, 20 min	**radiation β radiation γ 25 kGy**	**C_2H_4O** (ethylene oxide)	**formalin, ethanol**
PS	○	●	○	●
SAN	○	○	●	●
PMMA	○	●	○	●
PC	●[1)]	●	●	●
PVC	○[2)]	○	●	●
POM	●[1)]	●	●	●
PE-LD	○	●	●	●
PE-HD	○	●	●	●
PP	●	●	●	●
PMP	●	●	●	●
ECTFE ETFE	●	○	●	●
PTFE	●	○	●	●
FEP/PFA	●	○	●	●

FKM	●	○	●	●
EPDM	●	○	●	●
NR	○	○	●	●
SI	●	○	●	●

● may be used

○ cannot be used

* Laboratory vessels have to be exactly cleaned and rinsed with the distilled water before the sterilization in the autoclave. It is always necessary to remove closures from containers!

1) The frequent steam sterilization reduces mechanical durability! PC test tubes may become useless.

2) Except PVC hoses which are resistant to the steam sterilization in the temperature 121°C

Chemical resistance of plastics

	aldehydes	cyclic alcohols	esters	ether	ketones	strong or concentrated acids	weak or diluted acids	oxidizing substances	cyclic hydrocarbons	ahs	haloid hydrocarbons	alkalis
PS	○	●	○	○	○	○/●	○/●	○	○	○	○	●
SAN	○	●	○	○	○	○	○/●	○	○	○	○	●
PMMA	○/●	●	○	○	○	○	○/●	○	○/●	○	○	○
PC	○/●	●	○	○	○	○	○/●	○	○/●	○	○	○
PVC	○	●	○	○	○	●	●	○	●	○	○	●
POM	○/●	●	○	●	●	○	○	○	●	●	●	●
PE-LD		●	●	●	○/●	●	●	○	●	●	●	●
PE-HD	●	●	○/●	○/●	○/●	●	●	○	●	○/●	○/●	●
PP	●	●	○/●	○/●	○/●	●	●	○	●	○/●	○/●	●
PMP	○/●	●	○/●		○/●	●	●	○	○/●	○	○	●
ECTFE ETFE	●	●	●	●	○	●	●	●	●	●	●	●
PTFE FEP PFA	●	●	●	●	●	●	●	●	●	●	●	●
FKM	●	○	○	○	○	○	●	○/●	○/●	○/●	○/●	○/●
EPDM	●	●	○/●	○	○/●	●	●	○/●	○	○	○	●
NR	○/●	●	○/●	○	○	○	○/●	○	○	○	○	●
SI	○/●	●	○/●	○	○	○	○/●	○	○	○	○	○/●

●	very good	Permanent action of the substance does not cause damage through 30 days. The material is able to be resistant through years
○/●	good to limited	Continuous action of the substance causes insignificant and partly reversible damage through the period of 7-30 days (e.g. puffing up, softening, reduced mechanical durability, discolouring).
○	limited	The material should not have the continuous contact with the substance. The immediate occurrence of damage is possible (e.g. the loss of mechanical durability, deformation, discolouring, bursting, dissolving).

Plastics

PS	polystyrene	**ECTFE**	ethylene/chlorotrifluoroethylene
SAN	styrene-acrylonitrile	**ETFE**	ethylene/tetrafluoroethylene
PMMA	polymethyl methacrylate	**PTFE**	polytetrafluoroethylene
PC	polycarbonate	**FEP**	tetrafluoroethylene/perfluoropropylene
PVC	polyvinyl chloride	**PFA**	tetrafluoroethylene/perfluoroalkylvinylether
POM	acetal polyoxymethylenel	**FKM**	fluorcarbon rubber
PE-LD	low density polyethylene	**EPDM**	ethylene propylene diene
PE-HD	high density polyethylene	**NR**	natural rubber
PP	polypropylene	**SI**	silicon rubber
PMP	polymethylpentene		

DANGER!

For centrifuging infectious materials it is necessary to use hermetically closed buckets, in order to prevent they migration into the centrifuge.

Rotors, buckets and round carriers can be sterilized in autoclave with temperature 121 – 124°C and pressure 215 kPa during 20 min. In the centrifuge, disinfectants and cleaning agents generally used in medical care should be used (e.g. Aerodesina-2000, Lysoformin 3000, Melseptol, Melsept SF, Sanepidex, Cutasept F).

Additional accessories can be sterilized using autoclave depending on material that they are made of. See table STERILIZATION.

User is responsible for proper disinfections of the centrifuge, if some dangerous material was spilled inside or outside of the centrifuge. During the above mentioned works one must wear safety gloves.

10.4 Chemical resistance

One can use all standard disinfectants. The centrifuges and accessories are constructed from various materials and one should to take into account possible variety of materials. During sterilization by means of steam one should to consider temperature resistance of individual materials.

DANGER!

For centrifuging infectious materials it is necessary to use hermetically closed buckets, in order to prevent they migration into the centrifuge.

User is responsible for proper disinfections of the centrifuge, if some dangerous material was spilled inside or outside of the centrifuge. During the above mentioned works one must wear safety gloves.

11 Troubleshooting

Majority of faults could be removed by switching the centrifuge OFF and then ON. After switching the centrifuge ON, there shall be displayed parameters of the recently implemented program and sound signals comprising four successive tones shall be generated. In case of short-duration power failure the centrifuge terminates the cycle and displays PROGRAM ERROR code.

problem	question	remedy
Centrifuge does not start	*Is supply cable plugged into mains?*	*Plugs supply cable correctly.*
	Is master switch ON?	*Switch ON power supply.*
Motor error is displayed		Call service.
Centrifuge does not start (indications are proof for cycle in progress and motor does not start)	*Is* *symbol displayed?*	Wait till rotor stops and the symbol goes off.
	Is *symbol displayed?*	Close cover. symbol must switch off.
	Is *symbol blinking?*	Centrifugation cycle in progress, press STOP key or wait till cycle ends.
Centrifuge does not accelerate *(unbalance error)*	*Unequal rotor load.*	Centrifuge load shall be balanced.
	Inclined centrifuge.	Centrifuge shall be levelled.
	Faulty drive (mechanical damage).	Call service.
	Was centrifuge displaced during operation.	Switch ON the centrifuge again after opening and closing the cover.
(motor error)	*After stopping error rotor message is displayed*	Check if rotor number in started program is consistent with the number of the rotor installed in the centrifuge. Check rotor status (if there are coding magnets inserted)
	Centrifuge does not recognize the rotor and does not stop.	Switch the centrifuge OFF, then ON and check correctness of loaded program
It is not possible to open the cover	*symbol on the display is blinking, after pressing COVER key single tone is audible*	Rotor is still rotating. Wait for stopping of the rotor and displaying of the symbol.
	The sensor is connected correctly, and the error is still applying.	Call service.
Mains failure during run	*The message will be displayed on the display about the decay of tension.*	Wait for stopping of the rotor, clear the error by pressing the SET key.
Temperature sensor error	*The overheating message will be displayed.*	Switch the centrifuge OFF, then ON.
		Call service.
Error of the exceeding the temperature (50°C) in the chamber	*The overheating message will be displayed.*	Call service.

	EMERGENCY COVER RELEASE In case of e.g. mains failure it is possible to open cover manually. At first, one must be sure that rotor is not in the move (use inspection glass). On the left-hand side of the casing there is a lock. Insert emergency opening key (17642) into the lock and turn it counterclockwise. ***The cover can be unlocked and opened only when the rotor is in the rest state.***

12 Guarantee

Manufacturer grants to the Buyer the guarantee on conditions specified in the Guarantee Certificate. Buyer forfeits the right to guarantee repair when using the device inconsistently with the User manual provisions, when damage results from the User's fault.

Repairs should be carried out in authorized service workshops, granted with the MPW Certificate.

The centrifuge shall be sent to repair after decontaminating disinfections. Information about authorized service workshops could be obtained from the Manufacturer.

13 Disposal

- When you are disposing the device, the respective statutory rules must be observed.
- Pursuant to guideline 2002/96/EC (WEEE), all devices supplied after August 13, 2005, may not be disposed as part of domestic waste.
- The device belongs to 8th group (medical devices) and is categorized in business to business field.
- The icon of the crossed-out trash can shows that the device may not be disposed as part of domestic waste. The waste disposal guidelines of the individual EC countries might vary. If necessary, contact your supplier.

14 Manufacturer’s info

MPW MED. INSTRUMENTS

+48 **22 610 56 67** sales department
22 610 81 07 service
22 610 55 36 fax

Boremlowska 46 Street
04-347 Warsaw

http:// www.mpw.pl
e-mail: mpw@mpw.pl

DISTRIBUTOR:

15 ANNEXES

Indeks Cat. No	Nazwa Name	Probówka MPW MPW Tube
11199	**Wirnik kątowy 12 x 2/1,5ml, z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 12 x 2/1,5ml, with Hermetically Sealed Lid (angle 45°)** **(max RPM: 18 000 max RCF:24269 x g R max: 6.7cm)**	15011,15128
14084	Wkładka redukcyjna na probówkę 0,5ml (O 8mm) Round carrier for 0,5ml tube(O 8,0mm)	15127
14126	Wkładka redukcyjna na probówkę 0,4ml (O 5,8mm) Round carrier for 0,4ml tube (O 5,8mm)	15124
14133	Wkładka redukcyjna na probówkę 0,2ml (O 6,2mm) Round carrier for 0,2ml tube (O 6,2mm)	15125
11213C/A	**Wirnik kątowy 8 x 50ml na probówki Falcon®, komplet z pojemnikami 13275 lub 13278 z pokrywką (PC) 17151 (kąt 30°)** **Angle rotor 8 x 50ml for Falcon® tubes, complete with Buckets 13275 or 13278 with PC caps 17151(angle 30°)** **(max RPM: 5 500 max RCF:4227 x g R max: 12.5cm)**	
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055,15117
11213C/B	**Wirnik kątowy 8 x 50ml na probówki Falcon®, komplet z pojemnikami 13276 (kąt 30°)** **Angle rotor 8 x 50ml for Falcon® tubes, complete with Buckets 13276 (angle 30°)** **(max RPM: 5 500 max RCF:4227 x g R max: 12.5cm)**	
14035	Wkładka redukcyjna na probówkę 14ml (O 28,5/17x105mm) Round carrier for 14ml tube (O 28,5/17x105mm)	15046
14036	Wkładka redukcyjna na probówkę 5ml (O 28,5/14x92mm) Round carrier for 5ml tube (O 28,5/14x92mm)	
14043	Wkładka redukcyjna na probówkę 5ml (O 29/13x85mm) Round carrier for 5ml tube (O 29/13x85mm)	15120, 15419
14071	Wkładka redukcyjna na probówkę 30ml (O 25x100mm) Round carrier for 30ml tube (O 25x100mm)	15055,15056, 15117,15424
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
11216	**Wirnik kątowy 12 x 5ml (O 12x85mm), z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 12 x 5ml (O 12x85mm), with HermeticallySealed Lid (angle 45°)** **(max RPM: 14 000 max RCF:19064 x g R max: 8.7cm)**	15419
11217C/A	**Wirnik kątowy 10 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 10 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 6 000 max RCF:4226 x g R max: 10.5cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3m **** SELL OUT ****	15119
11217C/B	**Wirnik kątowy 10 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 10 x 10ml, complete with buckets 13081 (O 17x70/85mm) (angle 30°)** **(max RPM: 6000 max RCF:4226 x g R max: 10.5cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm) **** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3m **** SELL OUT ****	15054,15120, 15419

11461	**Wirnik kątowy 24 x 2/1,5ml, z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 24 x 2/1,5ml, with Hermetically Sealed Lid (angle 45°)** **(max RPM: 15 100 max RCF:21153 x g R max: 8.3cm)**	15011, 15128
14084	Wkładka redukcyjna na probówkę 0,5ml (O 8mm) Round carrier for 0,5ml tube(O 8,0mm)	15127
14126	Wkładka redukcyjna na probówkę 0,4ml (O 5,8mm) Round carrier for 0,4ml tube (O 5,8mm)	15124
14133	Wkładka redukcyjna na probówkę 0,2ml (O 6,2mm) Round carrier for 0,2ml tube (O 6,2mm)	15125
11462	**Wirnik kątowy 36 x 2/1,5ml, z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 36 x 2/1,5ml, with Hermetically Sealed Lid (angle 45°)** **(max RPM: 14 000 max RCF:18187 x g R max: 8.3cm)**	15011, 15128
14084	Wkładka redukcyjna na probówkę 0,5ml (O 8mm) Round carrier for 0,5ml tube(O 8,0mm)	15127
14126	Wkładka redukcyjna na probówkę 0,4ml (O 5,8mm) Round carrier for 0,4ml tube (O 5,8mm)	15124
14133	Wkładka redukcyjna na probówkę 0,2ml (O 6,2mm) Round carrier for 0,2ml tube (O 6,2mm)	15125
11501C/A	**Wirnik kątowy 30 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 30 x 15/10ml, complete with 13080 buckets (O 17x100/120mm) (angle 30°)** **(max RPM: 4500 max RCF: 3011 x g R max: 13.3cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11501C/B	**Wirnik kątowy 30 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 30 x 10ml, complete with 13081 buckets (O 17x70/85mm) (angle 30°)** **(max RPM: 4 500 max RCF: 3011 x g R max: 13.3cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
11715	**Wirnik kątowy 10 x 10ml (O 17x75mm), z hermetycznie uszczelnioną pokrywą (kąt 30°)** **Angle rotor 10 x 10ml (O 17x75mm), with Hermetically Sealed Lid (angle 30°)** **(max RPM:14 000 max RCF: 15558 x g R max: 7.1cm)**	15121
11716	**Wirnik kątowy 4 x 8 x 0,2ml PCR, z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 4 x 8 x 0,2ml PCR - strip tubes, with Hermetically Sealed Lid (angle 45°)** **(max RPM: 14 000 max RCF: 15339 x g R max: 7.0cm)**	15122,15130
11717	**Wirnik kątowy 18 x 2ml na probówki z filtrem, z hermetycznie uszczelnioną pokrywą (kąt 45°)** **Angle rotor 18 x 2ml for tubes with filter, with Hermetically Sealed Lid (angle 45°)** **(max RPM: 14 000 max RCF: 18187 x g R max: 8.3cm)**	
14084	Wkładka redukcyjna na probówkę 0,5ml (O 8mm) Round carrier for 0,5ml tube(O 8,0mm)	15127
14126	Wkładka redukcyjna na probówkę 0,4ml (O 5,8mm) Round carrier for 0,4ml tube (O 5,8mm)	15124
14133	Wkładka redukcyjna na probówkę 0,2ml (O 6,2mm) Round carrier for 0,2ml tube (O 6,2mm)	15125

11718C	**Wirnik kątowy 4 x 100ml, komplet z pojemnikami 13719 (kąt 30°)** **Angle rotor 4 x 100ml, complete with buckets 13719 (angle 30°)** **(max RPM: 6 300 max RCF: 5014 x g R max: 11.3cm)**	
14024	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier 15ml for Falcon® tube (O 17x120mm)	15050
14188	Podkładka (guma) pod probówki szklane 100/50/30/25ml Pad (rubber) under 100/50/30/25ml glass tubes	15052,15115, 15116,15117
14189C	Wkładka redukcyjna na probówkę 50ml Falcon® (O 30x120mm) lub Nalgene®, komplet z gumową podkładką 14188 Round carrier 50ml for Falcon® tube (O 30 x120mm) or Nalgene®, complete with rubber pad 14188	15051,15052
14190C	Wkładka redukcyjna 30/25ml (O 25,5x102mm), komplet z gumową podkładką 14188 Round carrier 30/25ml (O 25,5 x100mm), complete with rubber pad 14188	15055, 15056, 15117
14192C	Wkładka redukcyjna 50ml (O 35x100mm), komplet z gumową podkładką 14188 Round carrier 50ml (O 35 x100mm), complete with rubber pad 14188	15116
14196	Podkładka (PA) pod probówki z PP 100ml PA pad under 100ml PP tube	15040
14226	Wkładka redukcyjna na probówkę 50ml z dnem stożkowym, wolnostojąca GREINER® (O 30x103mm / max wysokość probówki: 117mm) Round carrier for 50ml conical bottom tube, with skirt - GREINER® (O 13,1x100mm / max height of tube: 117mm)	
11740C/A	**Wirnik kątowy 12 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 12 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 5 500 max RCF: 4058 x g R max: 12cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm) **** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11740C/B	**Wirnik kątowy 12 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 12 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 5500 max RCF: 4058 x g R max: 12cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
11741C/A	**Wirnik kątowy 8 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 8 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM:6 000 max RCF: 4226 x g R max: 10.5cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11741C/B	**Wirnik kątowy 8 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 8 x 10ml, complete with buckets 13081 (O 17x70/85mm) (angle 30°)** **(max RPM: 6000 max RCF: 4226 x g R max: 10.5cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419

11742C	**Wirnik kątowy 4 x 30/25ml, komplet z pojemnikami 13329 (kąt 45°)** **Angle rotor 4 x 30/25ml, complete with buckets 13329 (angle 45°)** **(max RPM: 6 000 max RCF: 4829 x g R max: 12cm)**	
14255	Wkładka redukcyjna na probówkę 7ml (O 13x100mm) Round carrier for 7ml tube (O 13/100mm)	15054,15119
14256	Wkładka redukcyjna na probówkę 15/10ml (O 17x120mm) Round carrier for 15/10ml tube (O 17/120mm)	15046,15048, 15053,15118
11743C	**Wirnik kątowy 12 x 30/25ml, komplet z pojemnikami 13329 (kąt 30°)** **Angle rotor 12 x 30/25ml, complete with buckets 13329 (angle 30°)** **(max RPM: 5 500 max RCF: 2716 x g R max: 12cm)**	
14255	Wkładka redukcyjna na probówkę 7ml (O 13x100mm) Round carrier for 7ml tube (O 13/100mm)	15054,15119
14256	Wkładka redukcyjna na probówkę 15/10ml (O 17x120mm) Round carrier for 15/10ml tube (O 17/120mm)	15046,15048, 15053,15118
11744C	**Wirnik kątowy 10 x 50ml na probówki Falcon®, komplet z pojemnikami 13276 (kąt 30°)** **Angle rotor 10 x 50ml for Falcon® tubes, complete with buckets 13276 (angle 30°)** **(max RPM:4 500 max RCF: 2830 x g R max: 12.5cm)**	
14035	Wkładka redukcyjna na probówkę 14ml (O 28,5/17x105mm) Round carrier for 14ml tube (O 28,5/17x105mm)	15046
14036	Wkładka redukcyjna na probówkę 5ml (O 28,5/14x92mm) Round carrier for 5ml tube (O 28,5/14x92mm)	
14043	Wkładka redukcyjna na probówkę 5ml (O 29/13x85mm) Round carrier for 5ml tube (O 29/13x85mm)	15120, 15419
14071	Wkładka redukcyjna na probówkę 30ml (O 25x100mm) Round carrier for 30ml tube (O 25x100mm)	15055,15056, 15117,15424
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
11745C/A	**Wirnik kątowy 24 x 15/10ml, komplet z pojemnikami 13080 (O 17x100/120mm) (kąt 30°)** **Angle rotor 24 x 15/10ml, complete with buckets 13080 (O 17x100/120mm) (angle 30°)** **(max RPM: 5 000 max RCF: 3354 x g R max: 12cm)**	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
11745C/B	**Wirnik kątowy 24 x 10ml, komplet z pojemnikami 13081 (O 17x70/85mm) (kąt 30°)** **Angle rotor 24 x 15/10ml, complete with buckets 13081(O 17x70/85mm) (angle 30°)** **(max RPM: 5000 max RCF: 3354 x g R max: 12cm)**	15053
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15054,15120, 15419
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15054,15120, 15419
11746C	**Wirnik kątowy 6 x 50ml na probówki Falcon®, komplet z pojemnikami 13276 (kąt 30°)** **Angle rotor 6 x 50ml for Falcon® tubes, complete with buckets 13276 (angle 30°)** **(max RPM: 6000 max RCF: 4427 x g R max: 11cm)**	
14035	Wkładka redukcyjna na probówkę 14ml (O 28,5/17x105mm) Round carrier for 14ml tube (O 28,5/17x105mm)	15046
14036	Wkładka redukcyjna na probówkę 5ml (O 28,5/14x92mm) Round carrier for 5ml tube (O 28,5/14x92mm)	
14043	Wkładka redukcyjna na probówkę 5ml (O 29/13x85mm) Round carrier for 5ml tube (O 29/13x85mm)	15120, 15419
14071	Wkładka redukcyjna na probówkę 30ml (O 25x100mm) Round carrier for 30ml tube (O 25x100mm)	15055,15056, 15117,15424
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm)	15050

	Round carrier for 15ml Falcon® tube (O 17x120mm)	
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
12172C/A	**Wirnik bębnowy 6 x 20 x 0,4/0,2ml, komplet z 6 kasetami 14000, z hermetycznie uszczelnioną pokrywą** **Drum rotor 6 x 20 x 0,4/0,2ml, complete with 6 14000 cassetes, with Hermetically Sealed Lid** **(max RPM: 14 500 max RCF: 16454 x g R max: 7cm)**	15125
12172C/B	**Wirnik bębnowy 6 x 10 x 2/1,5ml, komplet z 6 kasetami 14002, z hermetycznie uszczelnioną pokrywą** **Drum rotor 6 x 10 x 2/1,5ml, complete with 6 14002 cassetes, with Hermetically Sealed Lid** **(max RPM: 14 500 max RCF: 16454 x g R max: 7cm)**	15011, 15128
12183	**Wirnik horyzontalny 4 x 100ml** **Swing-out rotor 4 x 100ml** **(max RPM: 4 000 max RCF: 2469 x g R max: 13.8cm)**	
13182	Pojemnik 100ml (O 45x89mm) Bucket 100ml (O 45x89mm)	
14024	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier 15ml for Falcon® tube (O 17x120mm)	15050
14181	Wkładka redukcyjna 5 x 2/7ml (O 44,5/12,5x100mm) Round carrier 5 x 2/7ml (O 44,5/12,5x100mm)	15054,15119, 15120, 15419
14186	Wkładka redukcyjna 4 x 7ml na probówki Vacutainer® (O 13,1x100mm) Round carrier 4 x 7ml for Vacutainer® tubes (O 13,1x100mm)	15054,15119, 15120, 15419
14187	Wkładka redukcyjna 4 x 15/10ml na probówki Vacutainer® (O 16,5x112mm) Round carrier 4 x 15/10ml for Vacutainer® tubes (O 16,5x112mm)	15046,15048, 15053, 15118
14188	Podkładka (guma) pod probówki szklane 100/50/30/25ml Pad (rubber) under 100/50/30/25ml glass tubes	15052,15115, 15116,15117
14189C	Wkładka redukcyjna na probówkę 50ml Falcon® (O 30x120mm) lub Nalgene®, komplet z gumową podkładką 14188 Round carrier 50ml for Falcon® tube (O 30 x120mm) or Nalgene®, complete with rubber pad 14188	15051,15052
14190C	Wkładka redukcyjna 30/25ml (O 25,5x102mm), komplet z gumową podkładką 14188 Round carrier 30/25ml (O 25,5 x100mm), complete with rubber pad 14188	15055, 15056, 15117
14192C	Wkładka redukcyjna 50ml (O 35x100mm), komplet z gumową podkładką 14188 Round carrier 50ml (O 35 x100mm), complete with rubber pad 14188	15116
14194	Wkładka redukcyjna 5 x 1,5/2/2,2ml na probówki 15123, 15015 i 15128 Round carrier 5 x 1,5/2/2,2ml for 15123, 15015 and 15128 tubes	15123,15015, 15128
14196	Podkładka (PA) pod probówki z PP 100ml PA pad under 100ml PP tube	15040
14224	Wkładka redukcyjna na probówki Sterilin® 30ml Round carrier for Sterilin® 30ml tube	15055,15056, 15222, 15223
14226	Wkładka redukcyjna na probówkę 50ml z dnem stożkowym, wolnostojąca GREINER® (O 30x103mm / max wysokość probówki: 117mm) Round carrier for 50ml conical bottom tube, with skirt - GREINER® (O 13,1x100mm / max height of tube: 117mm)	
13184C	Pojemnik 100ml (O 45x96mm) z pokrywką (Al) 17185 Bucket 100ml (O 45x96mm) with 17185 cap (Al)	
14024	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier 15ml for Falcon® tube (O 17x120mm)	15050
14181	Wkładka redukcyjna 5 x 2/7ml (O 44,5/12,5x100mm) Round carrier 5 x 2/7ml (O 44,5/12,5x100mm)	15054,15119, 15120, 15419
14186	Wkładka redukcyjna 4 x 7ml na probówki Vacutainer® (O 13,1x100mm) Round carrier 4 x 7ml for Vacutainer® tubes (O 13,1x100mm)	15054,15119, 15120, 15419
14187	Wkładka redukcyjna 4 x 15/10ml na probówki Vacutainer® (O 16,5x112mm)	15046,15048,

	Round carrier 4 x 15/10ml for Vacutainer® tubes (O 16,5x112mm)	15053, 15118
14188	Podkładka (guma) pod probówki szklane 100/50/30/25ml Pad (rubber) under 100/50/30/25ml glass tubes	15052,15115, 15116,15117
14189C	Wkładka redukcyjna na probówkę 50ml Falcon® (O 30x120mm) lub Nalgene®, komplet z gumową podkładką 14188 Round carrier 50ml for Falcon® tube (O 30 x120mm) or Nalgene®, complete with rubber pad 14188	15051,15052
14190C	Wkładka redukcyjna 30/25ml (O 25,5x102mm), komplet z gumową podkładką 14188 Round carrier 30/25ml (O 25,5 x100mm), complete with rubber pad 14188	15055, 15056, 15117
14192C	Wkładka redukcyjna 50ml (O 35x100mm), komplet z gumową podkładką 14188 Round carrier 50ml (O 35 x100mm), complete with rubber pad 14188	15116
14194	Wkładka redukcyjna 5 x 1,5/2/2,2ml na probówki 15123, 15015 i 15128 Round carrier 5 x 1,5/2/2,2ml for 15123, 15015 and 15128 tubes	15123,15015, 15128
14196	Podkładka (PA) pod probówki z PP 100ml PA pad under 100ml PP tube	15040
14226	Wkładka redukcyjna na probówkę 50ml z dnem stożkowym , wolnostojąca GREINER® (O 30x103mm / max wysokość probówki: 117mm) Round carrier for 50ml conical bottom tube, with skirt - GREINER® (O 13,1x100mm / max height of tube: 117mm)	15055,15056, 15222, 15223
13195	Zawieszka 2 x 15ml na probówki Falcon®, kompletna z pojemnikami 13080 (O 17x100/120mm) Hanger 2 x 15ml for Falcon® tube, complete with buckets 13080 (O 17x100/120mm)	15048,15050, 15053,15118
14082	Wkładka redukcyjna (O 13,3mm) Round carrier (O 13,3mm)	15119
14083	Wkładka redukcyjna (O 13,3mm)**** DO WYCZERPANIA ZAPASÓW **** Round carrier (O 13,3mm) **** SELL OUT ****	15119
13265	Pojemnik na probówkę do systemu Arthrex ACP kompletny z pokrywką (Al) Bucket for Arthrex ACP system tube, complete with cap (Al)	
13266	Pojemnik 50ml na probówkę Falcon® (O 30x100mm) Bucket 50ml for Falcon® tube (O 30x100mm)	
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
13267C	Pojemnik 50ml na probówkę Falcon® z pokrywką 17151 (PC) (O 30x100mm) Bucket 50ml for Falcon® tube, complete with 17151 cap (polycarbone)	
14089	Wkładka redukcyjna na probówkę 15ml Falcon® (O 17x120mm) Round carrier for 15ml Falcon® tube (O 17x120mm)	15050
14248	Wkładka redukcyjna na probówkę 30/25ml (O 26x102mm) Round carrier for 30/25ml tube (O 26x102mm)	15055, 15117
12218C	**Wirnik horyzontalny titracyjny, komplet z 2 zawieszkami 13219 na płytki mikrotitracyjne** **Microtiter rotor head, complete with 2 buckets 13219 for microtiter plates** **(max RPM: 3 000 max RCF: 916 x g R max: 9.1cm)**	15102
12232	**Wirnik horyzontalny 4 x 70ml** **Swing-out rotor 4 x 70ml** **(max RPM: 4 000 max RCF: 2308 x g R max: 12.9cm)**	
13170	Pojemnik 12 x 5ml na probówki Monovette® (O 13x81mm) Bucket 12 x 5ml for Monovette® tubes (O 13 x 81mm)	15120, 15419
13233	Pojemnik 70ml (O 57x66mm) na wkładki redukcyjne Bucket 70ml (O 57x66mm)	

14169	Wkładka redukcyjna 8 x 4ml (O 13x81mm) Round carrier 8 x 4ml (O 13x81mm)	15120, 15419
14235	Wkładka redukcyjna 12 x 5ml (O 12x75mm) Round carrier 12 x 5ml (O 12x75mm)	15120, 15419
14238	Wkładka redukcyjna 7 x 10ml (O 17x75mm), niska Round carrier 7 x 10ml (O 17x75mm), short	15121
14239	Wkładka redukcyjna 7 x 5ml (O 13,5x75mm), niska Round carrier 7 x 5ml (O 13,5x75mm), short	15120, 15419
14240	Wkładka redukcyjna 9 x 2/1,5ml (O 11x38,5mm) Round carrier 9 x 2/1,5ml (O 11x38,5mm)	15011, 15128
14242	Wkładka redukcyjna 12 x 1,2ml na probówki S-Monovette® (O 56x66mm), niska Round carrier 12 x 1,2ml for S-Monovette® tubes (O 56x66mm), short	15016
12300	**Wirnik hematokrytowy na 24 kapilary 75mm** **Hematocrite rotor for 24 capillaries 75mm** **(max RPM: 13 000 max RCF: 16816 x g R max: 8.9cm)**	15100
16135	Czytnik hematokrytowy płaski**** DO WYCZERPANIA ZAPASÓW **** Hematocrite reader - flat**** SELL OUT ****	
16164	Czytnik hematokrytowy okrągły Hematocrite reader - round	

Indeks Cat. No	PROBÓWKI TUBES
15011	Probówka z polipropylenu 2ml (O 10,8x40mm), okrągłodenna Polypropylene tube 2ml (O 10,8x40mm), round - bottom
15016	Probówka S-Monovette 1,2ml S-Monovette tube 1,2ml
15040	Probówka z polipropylenu 100ml z pokrywką (O 44,7/47x103,7mm) Polypropylene tube 100ml with cap (O 44,7/47x103,7mm)
15046	Probówka z polipropylenu 14ml z korkiem (O 16,8/17,7x106mm) Polypropylene tube 14ml with cap (O 16,8/17,7x106mm)
15048	Probówka z polipropylenu 15ml Nalgene® (O 16x113mm) Polypropylene tube 15ml Nalgene® (O 16x113mm)
15050	Probówka z polipropylenu 15ml z dnem stożkowym (O 17/21x120mm) Polypropylene tube 15ml with conical bottom (O17/21x120mm)
15051	Probówka z polipropylenu 50ml Nalgene® Polypropylene tube 50ml Nalgene (O 28,8x106,7mm)
15052	Probówka z polipropylenu 50ml z dnem stożkowym, z pokrywką (O 29,5/34x117mm) Polypropylene tube 50ml with conical bottom, with cap (O 29,5/34x117mm)
15053	Probówka z polipropylenu 10ml z pokrywką (O 16x100mm) Polypropylene tube 10ml with cap (O 16x100mm)
15054	Probówka z polipropylenu 6ml z pokrywką (O 11,7/13,5x95mm) Polypropylene tube 6ml with cap (O 11,7/13,5x95mm)
15055	Probówka z polipropylenu 30ml z pokrywką (O 24,9x103mm) Polypropylene tube 30ml with cap (O 24,9x103mm)
15056	Probówka z poliwęglanu 30ml Nalgene®z pokrywką (O 25,5x94mm) Policarbonate tube 30ml Nalgene® with cap (O 25,5x94mm)
15100	Kapilary szklane heparynowane (1,4 x 75mm, 37µl) Capillary tubes heparinized (1,4 x 75mm, 37µl)
15102	Płytka titracyjna z pokrywką (85,5x127mm) Microtiter plate with cap (85,5x127mm)

15115	Probówka szklana 100ml (O 45x100mm) Glass tube 100ml (O 45x100mm)
15116	Probówka szklana 50ml (O 35x100mm) Glass tube 50ml (O 35x100mm)
15117	Probówka szklana 25ml (O 25x100mm) Glass tube 25ml (O 25x100mm)
15118	Probówka szklana 10ml (O 16x100mm) Glass tube 10ml (O 16x100mm)
15119	Probówka szklana 7ml (O 12x100mm) Glass tube 7ml (O 12x100mm)
15120	Probówka szklana 5ml (O 12x75mm) Glass tube 5ml (O 12x75mm)
15121	Probówka z PP 10ml z pokrywką (O 17/19x70mm) Polypropylene tube 10ml with cap (O 17/19x70mm)
15122	Probówki z polipropylenu PCR szeregowe 8 x 0,2ml ze zintegrowanymi pokrywkami (O6x21mm
15123	Probówka z polipropylenu 2,2ml z pokrywką - do zestawu cytologicznego (O 10,8x43mm) Polypropylene tube 2,2ml with cap - for cyto (O 10,8 x43mm)
15124	Probówka z polipropylenu 0,4ml z pokrywką (O 5,7x46mm) Polypropylene tube 0,4ml with cap (O 5,7x46mm)
15125	Probówka z polipropylenu 0,2ml PCR (O 6x21mm) Polypropylene tube 0,2ml PCR (O 6x21mm)
15127	Probówka z polipropylenu 0,5ml z pokrywką (O 7,8x30mm) Polypropylene tube 0,5ml with cap (O 7,8x30mm)
15128	Probówka z polipropylenu 1,5ml z pokrywką (O 10,8x39mm) Polypropylene tube 1,5ml with cap (O 10,8x39mm)
15130	Probówki z polipropylenu PCR szeregowe 8 x 0,2ml z odrębnymi pokrywkami w szeregu (O 6x21mm) Polypropylene PCR stripe 8x0,2ml (O 6x21mm)
15222	Pojemnik Sterilin® z polistyrenu 30ml z pokrywką (O 31x94mm) Sterilin®, polystyrene test tube 30ml with cap (O 31x94mm)
15223	Pojemnik Sterilin® z polipropylenu 30ml z pokrywką (O 31x94mm) Sterilin®, polypropylene test tube 30ml with cap (O31x94mm)
15419	Probówka z polipropylenu 5ml z korkiem (O 12x85mm) Polypropylene tube 5ml (O12x85mm) with cap
15424	Probówka z polipropylenu 30ml z pokrywką (O 25,5x94mm) Polypropylene tube 30ml with cap (O 25,5x94mm)

DECLARATION OF CONFORMITY

Product	**Laboratory centrifuge**
Model	**MPW-260**
Product classification on the basis of the Directive 98/79/EC	Non classified to list A or B and not for self-testing

Product complies with the requirements:

· Directive 98/79/EC (IVD), including the requirements of harmonised standards:

PN-EN ISO 13485:2012	PN-EN ISO 18113-3:2011
PN-EN ISO 13485:2012/AC:2013-03	PN-EN 61010-2-101:2005
PN-EN 13612:2006	PN-EN 61326-2-6:2013-08
PN-EN ISO 14971:2012	PN-EN ISO 62366:2008

· selected harmonized standards of Directive 2006/95/EC (LVD):

PN-EN 61010-1:2011	PN-EN 61010-2-020:2008

· Directive 2004/108/WE (EMC)

· standard PN-EN ISO 15223-1:2012

CZŁONEK ZARZĄDU
Wojciech Nojszewski

PREZES ZARZĄDU
mgr Hanna Maltzynska

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
w Warszawie

Warsaw, 13.11.2014

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
Warsaw, 46 Boremlowska Street
Quality policy in line with ISO 9001:2008
Certifying authority

TÜVRheinland CERTIFIED Management System www.tuv.com ID 0000023838

nr 10.260.03

DECLARATION OF CONFORMITY

Product	**Refrigerated laboratory centrifuge**
Model	**MPW-260R**
Product classification on the basis of the Directive 98/79/EC	Non classified to list A or B and not for self-testing

Product complies with the requirements:

· Directive 98/79/EC (IVD), including the requirements of harmonised standards:

PN-EN ISO 13485:2012	PN-EN ISO 18113-3:2011
PN-EN ISO 13485:2012/AC:2013-03	PN-EN 61010-2-101:2005
PN-EN 13612:2006	PN-EN 61326-2-6:2013-08
PN-EN ISO 14971:2012	PN-EN ISO 62366:2008

· selected harmonized standards of Directive 2006/95/EC (LVD):

PN-EN 61010-1:2011	PN-EN 61010-2-020:2008

· Directive 2004/108/WE (EMC)

· standard PN-EN ISO 15223-1:2012

CZŁONEK ZARZĄDU
Wojciech Nojszewski

PREZES ZARZĄDU
mgr Hanna Małczyńska

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
w Warszawie

Warsaw, 13.11.2014

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
Warsaw, 46 Boremlowska Street
Quality policy in line with ISO 9001:2008
Certifying authority

Management System
TÜVRheinland CERTIFIED
www.tuv.com ID 0000023838

nr 10.260R.03

DECLARATION OF CONFORMITY

Product	**Refrigerated and heated laboratory centrifuge**
Model	**MPW-260RH**
Product classification on the basis of the Directive 98/79/EC	Non classified to list A or B and not for self-testing

Product complies with the requirements:

· Directive 98/79/EC (IVD), including the requirements of harmonised standards:

PN-EN ISO 13485:2012	PN-EN ISO 18113-3:2011
PN-EN ISO 13485:2012/AC:2013-03	PN-EN 61010-2-101:2005
PN-EN 13612:2006	PN-EN 61326-2-6:2013-08
PN-EN ISO 14971:2012	PN-EN ISO 62366:2008

· selected harmonized standards of Directive 2006/95/EC (LVD):

PN-EN 61010-1:2011	PN-EN 61010-2-020:2008

· Directive 2004/108/WE (EMC)

· standard PN-EN ISO 15223-1:2012

CZŁONEK ZARZĄDU
Wojciech Nojszewski

PREZES ZARZĄDU
mgr Hanna Małczyńska

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
w Warszawie

Warsaw, 13.11.2014

„MPW MED. INSTRUMENTS"
SPÓŁDZIELNIA PRACY
Warsaw, 46 Boremlowska Street
Quality policy in line with ISO 9001:2008
Certifying authority

Management System
TÜVRheinland CERTIFIED
www.tuv.com ID 0000023838

nr 10.260RH.03

DECLARATION OF DECONTAMINATION

In order to protect our employees please fill out the declaration of decontamination completely before sending centrifuge to the manufacturer (repair).

1. **Device**
   – type: ……
   – serial No.: ……

2. **Description of decontamination**
   (see user manual)
   ……
   ……
   ……
   ……

3. **Decontamination carried out by:**
   – name: ……

4. **Date and signature** ……

DECLARATION OF DECONTAMINATION

In order to protect our employees please fill out the declaration of decontamination completely before sending centrifuge to the manufacturer (return).

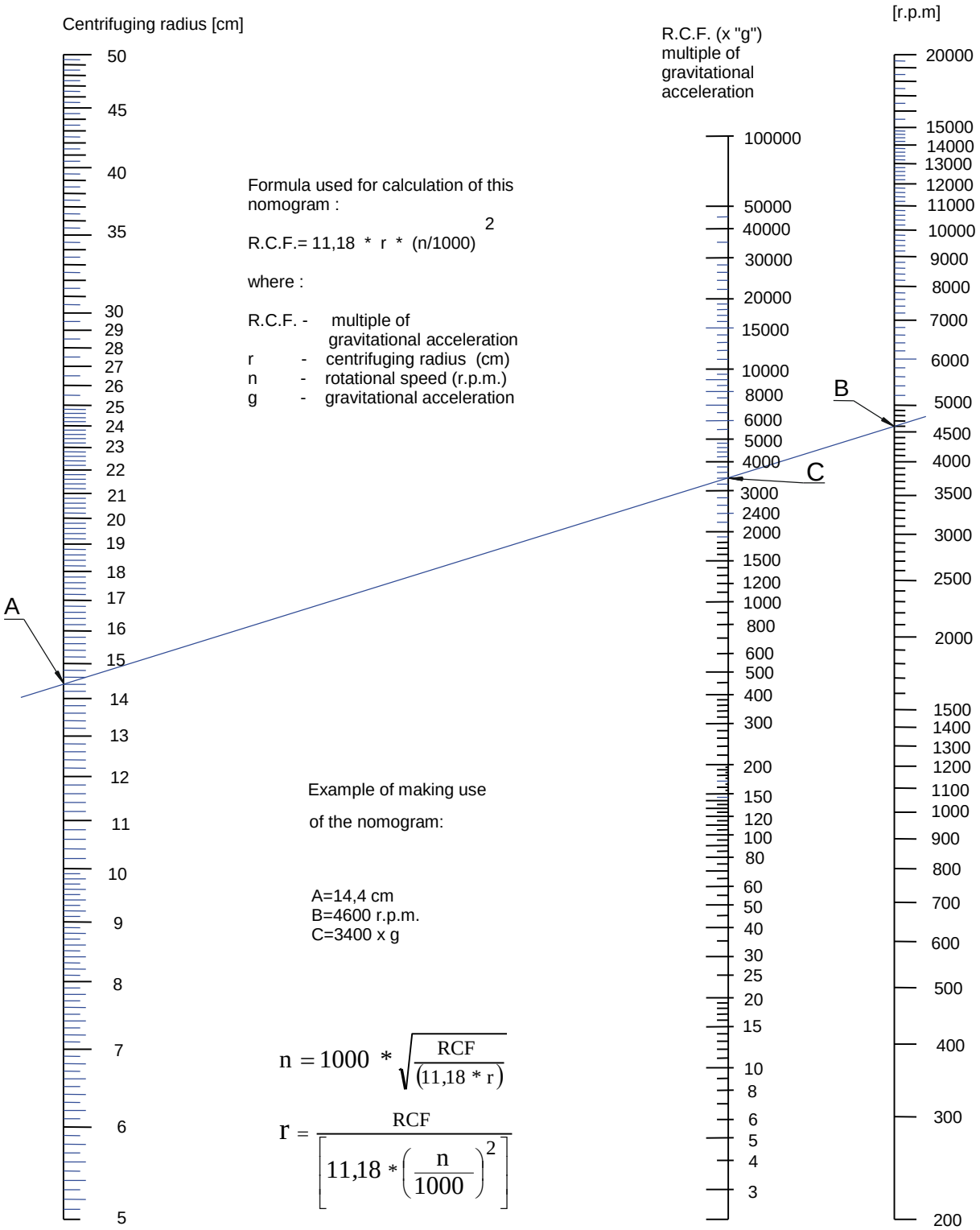
5. **Device**
   – type: ……
   – serial No.: ……

6. **Description of decontamination**
   (see user manual)
   ……
   ……
   ……
   ……

7. **Decontamination carried out by:**
   – name: ……

8. **Date and signature** ……

NOMOGRAM



Formula used for calculation of this nomogram :

$$R.C.F. = 11{,}18 * r * (n/1000)^2$$

where :

R.C.F. - multiple of gravitational acceleration
r - centrifuging radius (cm)
n - rotational speed (r.p.m.)
g - gravitational acceleration

Example of making use of the nomogram:

A=14,4 cm
B=4600 r.p.m.
C=3400 x g

$$n = 1000 * \sqrt{\frac{RCF}{(11{,}18 * r)}}$$

$$r = \frac{RCF}{\left[11{,}18 * \left(\frac{n}{1000}\right)^2\right]}$$